BULLETIN

of the

BRITISH ORNITHOLOGISTS' CLUB

EDITED BY

DR. J. F. MONK

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PREFACE

It is realised by few what a debt is owed to Mr. and Mrs. Con Benson for their annual production of immutable facts in the index. It is mainly in the future that its real worth will be recognised by the researcher, perhaps an officer of the Club deputed to reveal the inner values of the *Bulletin*, or a student, may be, of African ornithology in search of the tiresome reforms of an earlier taxonomist or nomenclatorial busybody. Then, the meticulous compilation and its reliability will certainly be recognised. I hope those who use it will think awhile on the work it has entailed and that all will thank the authors for its assured present and future use.

The apparent and actual value of the *Bulletin* for publications of authors working in remoter places, as well as quite extensive cover of subjects submitted for publication, is analysed briefly in the Committee's Annual Report.

I am as usual, though no less sincerely, most grateful to referees, the printers and the authors themselves for their obliging cooperation during the last 12 months in helping the efforts made to maintain the high standard and punctuality of the *Bulletin.*

JAMES F. MONK

COMMITTEE

LIST OF MEMBERS: AMENDMENTS UP TO 31st DECEMBER 1978

(Compiled by Mrs. D. M. Bradley and R. E. F. Peal)

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MOORE, A. G., B.A., 34 Clarendon Gardens, London, N9.
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PINE, Dr. R. S., M.R.C.S., L.R.C.P., 11 Winston Avenue, New Southgate N11 2AS.
POYSER, T., 281 High Street, Berkhamsted, Herts. HP4 1AJ.
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Resignations

GINN, H. B.; LINDBERG, N. P.; PERRIN, Dr. M. R.; SMITH, A. P.

Removed from Membership

AUSTIN, G. T.; BUCKLEY, P. A.; CARPENTER, C. F.; EDGAR, R. M. D.; ERVIN, S.; HOPKINS, J. R.; KING, D. G.; MORISON, A. F.; NICHOLS, Mrs. H. A. J.; TARBOTON, W. R.; WILLIS, G. S.

Deaths

The Committee much regrets to record the deaths of ADAMS, L. E. G.; HARRISON, Dr. J. G., O.B.E., M.R.C.S., L.R.C.P., D.R.C.O.G. (Editor 1952–1961, Hon. Secretary 1962–1964); RHODES, Miss G. M. (Hon. Secretary 1949–1950); ROBERTS, Dr. B. B., PH.D.; WETMORE, Dr. Alexander, HON.M.B.O.U.; WHITE, C. M. N., M.B.E., M.A.

LIST OF AUTHORS AND CONTENTS

INDEX TO SCIENTIFIC NAMES

(Compiled by C. W. Benson with the assistance of Mrs. C. W. Benson and Mrs. M. Hawksley)

All generic and specific names (of birds only) are indexed. Subspecific names are included only if new and are also indexed in bold print under the generic and the specific names.

Corrigenda

p. 8, line 7: '*Pyrenestes*', not '*Pyrinestes*'

'*oryzivora*' not '*orizivora*'

p. 9, line 49: 'Parkes', not 'Parks'

p. 12, lines 37, 44: '*flavicans*', not '*flavican*'

p. 27, line 43: '1947', not '1974'

p. 54, line 8: '*clara*', not '*clarus*'

p. 55, line 36: 'S. G. Madge', not 'S. C. Madge'

p. 84, line 14: '*melanocephalus*', not '*melanocephala*'

p. 84, line 19: '*namaquus*', not '*namaquas*'

p. 85, line 27: '*saxatilis*', not '*saxicola*'

p. 86, line 51: '*pyrgita*', not '*pygita*'

p. 95, line 36: '*philippensis*', not '*phillipensis*'

p. 97, line 32: '*Prosopeia*' not '*Prosepeia*'

p. 98, line 32: '*johannae*', not '*johannoe*'

p. 121, line 12: '*melanotos*', not '*melanotus*'

p. 129, line 15: '*phoenicea*', not '*phoenicia*'

p. 138, line 37: '*Motacilla*', not '*Moticilla*'

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Bulletin of the

British Ornithologists' Club

Edited by

Dr. J. F. MONK

Volume 98 No. 1 March 1978

ANNUAL GENERAL MEETING

The Annual General Meeting of the Club will be held in the Senior Common Room, South Side, Imperial College, Prince's Gardens, London, S.W.7 at 6 p.m. on Wednesday, 31 May 1978.

AGENDA

1. Minutes of the last Annual General Meeting.

2. Report of the Committee and Accounts for 1977.

3. The *Bulletin*.

4. Election of Officers.

   The Committee proposes that:—

   (a) Mrs. Diana Bradley be elected Hon. Treasurer *vice* Mr. M. St. J. Sugg, who is retiring.

   (b) Mr. R. E. F. Peal be re-elected Hon. Secretary.

   (c) Mr. P. J. Oliver be elected a member of the Committee *vice* Mrs. Diana Bradley, who retires by rotation.

5. Any other business of which notice shall have been given in accordance with Rule (7).

By Order of the Committee,

RONALD E. F. PEAL.
Honorary Secretary.

FORTHCOMING MEETINGS

Wednesday, 31 May 1978 at 6.30 p.m. for 7 p.m. at the Senior Common Room, South Side, Imperial College, South Kensington (entrance on the south side of Prince's Gardens, S.W.7, off Exhibition Road). Mr. A. S. Cheke on "Adaption and Opportunity, or Old habits die hard". Those wishing to attend must send a cheque for £3.75 per person to Mrs. Diana Bradley, 53 Osterley Road, Isleworth, Middlesex with their acceptance on the enclosed slip to arrive not later than the first post on Thursday, 25 May 1978.

July 1978. There will be a distinguished speaker who has attended the XVII I.O.C. at Berlin in June. The date of the meeting (probably 18 July 1978) and full details will be given in the June *Bulletin*. If the meeting has to be on a considerably earlier date, special notice will be given to all those who have attended a Club meeting in the last two years; any others who would like to know are requested to inform the Hon. Secretary before the end of May.

Tuesday, 19 September 1978. Mr. J. L. P. Parslow on "The function of the R.S.P.B. in British Ornithology".

Tuesday, 21 November 1978, jointly with the B.O.U., at Imperial College. Speakers—Mr. E. M. Nicholson, C.B. on "The role of British Ornithologists in Europe" and Mr. P. J. Conder, O.B.E. on "An example of wildfowl management abroad".

Tuesday, 9 January 1979. Mr. J. H. R. Boswall on "Mutual mimics, men as birds and birds as men—an ornithological frolic".

[*Bull. B.O.C. 1978:* 98(1)]

Bulletin of the BRITISH ORNITHOLOGISTS' CLUB

Vol. 98 No. 1 Published: 20 March 1978

REPORT OF THE COMMITTEE FOR 1977

During 1977 inflation continued at a high rate with postage charges for the *Bulletin* and printing charges both rising 11%. The price of dinners rose similarly.

Meetings were held in January and July at the Goat Tavern, in May, September and November at Imperial College and in March, when we invited the International Council for Bird Preservation (British Section) to join us, at the British Museum (Natural History). Attendance at meetings (counting, in respect of the March meeting, only club members and their guests) totalled 179, a larger number than in either of the two preceding years.

Leaflets with covering letters were sent to about 500 universities, museums and other scientific institutions in the past year to promote the circulation of the *Bulletin*. The response in new *Bulletin* subscriptions was not great, although it also brought in some new members, but it caused a very satisfactory increase in orders for back-numbers. The policy of reprinting back-numbers as necessary to maintain a stock of all numbers from 1952 (Vol. 72) to date has been continued. Stocks are also held of many earlier issues and details will gladly be supplied on request.

There were 34 new members in 1977 but two members resigned and the membership of one was terminated under Rule (4). The Committee records with deep regret the death of Sir Landsborough Thomson C.B., O.B.E., D.Sc., Ll.D. (Hon. Secretary 1935–1938, Chairman 1938–1943). There were 13 new *Bulletin* subscribers in the year.

The audited accounts for 1977, which are not yet available, will be tabled at the Annual General Meeting and published in a later number of the *Bulletin*.

It is of interest to note that in the last 25 years circulation of the *Bulletin* has increased whilst attendances at meetings have fallen. In 1952 there were 185 paid-up members and 65 non-member subscribers to the *Bulletin*; by the end of 1977 there were 293 and 140 respectively. In 1952 Club attendance at meetings was 508, it fell to 128 in 1969 and was 179 last year. The *Bulletin* comprised 118 pages (including index) and cost £346 (£2·95 per page) in 1952 whereas in 1977 152 pages (including index) cost £2,320 (£15.26 per page). The subscription for members was then £1.05 (U.S. $2.92; Sw.Fr. 12.85) and 25 years after was £3.50 ($5.96; Sw.Fr. 14.60).

There must be an appreciable number of ornithologists, at home and abroad, who might value membership of the Club or a subscription to the *Bulletin*, yet be in ignorance of both. It is to be hoped that members will at all times bear it in mind to benefit the Club by proposing new members and making the *Bulletin* even more widely known.

* * *

The Seven hundred and tenth Meeting of the Club was held in the Senior

Common Room, South Side, Imperial College, London, S.W.7., on Tuesday, 17 January 1978 at 7 p.m.

Chairman: Mr. Peter Hogg; present 16 members and 3 guests.

Dr. J. G. Harrison, O.B.E., and Dr. Pamela Harrison presented 'Indian Interlude', being a most interesting description of a visit to India, illustrated by excellent slides.

A River Warbler *Locustella fluviatilis* 'wintering' and moulting in Zambia

by J. J. Tucker

Received 17 August 1977

The River Warbler *Locustella fluviatilis* spends the Palaearctic winter somewhere in southern Africa, passing through east Africa, (Ash 1973, 1977, Backhurst *et al.* 1973) and possibly also west Africa. In December and January, individuals on southward passage occur in east Africa in Kenya and less commonly in Tanzania and Zambia and reappear there sparingly on northward passage in March and April (Backhurst *et al.* 1973, Benson *et al.* 1971, Dowsett 1972). The much larger number of records from east Africa in recent years—330 of a total of 359 caught there up to 1974 being trapped from only 1971 to 1974 (Backhurst 1973, 1974)—compared with a Zambian total of 10 up to November 1976 may not reflect a genuine difference in distribution; but may rather demonstrate the advantage of trapping (in the Tsavo National Park, Kenya) at an illuminated wall, which produces the same effect as a lighthouse in misty weather by attracting and grounding nocturnal migrants. In February, River Warblers seemingly disappear from east Africa and it has generally been assumed that they move south of the Zambezi River, to winter and moult in southern Africa. Paradoxically, in Africa south of the Zambezi the species is considered very rare and its status there requires further investigation (Dowsett 1972). This note reports the apparent "wintering" of a River Warbler in Zambia.

At Kabulonga (15° 25′ S, 28° 21′ E) near Lusaka, Zambia, a River Warbler was trapped on the evening of 19 Dec. 1975 and a second on the evening of 20 Dec. (Table 1). Both birds were ringed and released. The mist-net used was sited between a 2 m high clump of *Lantana camara* bush and low thorn scrub on well drained ground. Passage migration of species such as *Sylvia communis*, *S. borin*, *Acrocephalus arundinaceus* and *A. palustris* was in progress at the time. Habitats of River Warblers, summarised by Moreau (1972), vary widely from *Phragmites* reeds to short grass under miombo woodland.

TABLE 1

Weights (g) and measurements (mm) of two *Locustella fluviatilis* at Kabulonga, Zambia

Date	*Weight (time)*	*Wing*	*Tail*	*Tarsus*	*Culmen*	*Primary Moult*	*Notes*
19.xii.75	16·5 (18 hrs)*	72	55	22	16	O^6N^4	tongue-spots present
20.xii.75	18·2 (20 hrs)	74	53	23	13·5	slightly worn	brood-patch absent

* Next morning (06 hrs) weight before release was 15·1 g, on 23 Feb. (20 hrs) was 17·2 g and on 24 Feb. was 16·7 g (20 hrs).

The primaries on both wings of both birds were slightly worn but the 19 December bird had the outer 4 primaries very fresh; yet these same 4 primaries were moulted again in February (see below). The possibility of an arrested moult seems unlikely and the presence of tongue-spots indicate a first year bird (Svenson 1970), which should not normally by then have moulted, certainly not initially with the outer 4 primaries. Backhurst (*in litt.* cited in Dowsett 1972) recorded 3 birds in Kenya in December with the identical combination of 4 new outer primaries and tongue-spots. Backhurst & Pearson (1976) discuss the phenomenon further, without mention of tongue-spots, stating that 9 autumn birds aged on skull ossification proved to be young birds with uniform primaries while 2 others so aged were adults with contrasting primaries. Ash (1973) records a River Warbler at Koka, Ethiopia on 16 September which was moulting its primaries and Mead & Watmough (1976) recorded arrested primary moult in the closely related *L. luscinioides* on the Iberian peninsula in autumn.

Nets had not been used at the Kabulonga site earlier in the year and were used further on 2–4, 15–22 and 26–30 January and 14–26 February. On 23 February the first of the two River Warblers caught in December was retrapped in a net about 20 m from that in which it was originally captured 66 days before. The bird weighed 17·2 g at 20 hrs and when netted again about 5 m away the next day weighed 16·7 g at 20 hrs. It was moulting as follows:

Primaries: inner 6 fresh, 7th 3/5 grown, outermost 3 in pin.

Secondaries: outermost (6th) fresh, 5th 4/5 grown, 4th in pin, innermost 3 old.

Retrices: all 1/5 grown.

Head, underparts and back were in active moult as were the wing coverts, which were judged 9/10 fresh.

The only other record of active moult in the River Warbler is of one in Zambia on 23 January in which the mantle was in heavy moult and the primaries and secondaries in early moult (Dowsett 1972).

Weights are within the range, namely 16·0–19·2 g, for Zambian specimens given by Dowsett (1972), with the exception of the low morning weight on 20 December, and also within the range given by Backhurst & Pearson (1976), namely 13·6–21·2 g and Ash (1973), namely 14·8–19·8 g.

Extreme dates of sub-Saharan records of the River Warbler, taken from Dowsett (1972), Ash (1973, 1977) and Backhurst & Pearson (1976) are summarised as follows:

Ethiopia: 23 Sept.–19 Nov.	Kenya: 19 Nov.–14 Jan. 12–24 Apr.
Uganda: one in Nov.	Tanzania: one in "spring".
Malawi: 30 Jan.	Zambia: 25 Dec.–26 Jan. 26 Mar.
Rhodesia: 25–29 Jan.	South Africa: 12 Dec.–19 Jan.

There are 6 subsequent Zambian records. Singles were seen at one locality near Lusaka on 11 and 18 January 1975 (Stjernstedt 1975), followed by one near Kariba in the Zambezi Valley on 19 January 1975 (Aspinwall 1975). Griffin (*in litt.*) mist-netted 3 near Lusaka in December 1976/January 1977. Until the capture in March all birds had occured between 19 December and 26 January.

The 19 December bird at Kabulonga, which appeared to be in a condition for flying any normal necessary distance, seems likely, but not necessarliy, to have spent the next 2 months in the neighbourhood of the trapping site.

When retrapped on 23 February it was certainly not capable of more than local flights, owing to its moult. It still remains to be seen where the main population of the River Warbler winters.

I should like to thank Drs. J. H. Lawton and J. F. Monk for their helpful comments on drafts of this note.

References:
Ash, J. S. 1973. Six species of birds new to Ethiopia. *Bull. Brit. Orn. Cl.* 93: 3–6.
— 1977. Four species of birds new to Ethiopia and other notes. *Bull. Brit. Orn. Cl.* 97: 4–9.
Aspinwall, D. R. 1975. River Warbler in the Zambezi Valley. *Bull. Zam. Orn. Soc.* 7(1): 21.
Backhurst, G. C. 1973. East African Bird Ringing Report 1971–1972. *Journ. E.A.N.H.S.* No. 144.
— 1974. East African Bird Ringing Report 1972–73, 1973–74. *Journ. E.A.N.H.S.* No. 146.
— Britton, P. L. & Mann, C. F. 1973. The less common Palaearctic migrant birds of Kenya and Tanzania. *Journ. E.A.N.H.S.* No. 140.
— & Pearson, D. J. 1976. The southward migration of Palaearctic birds over Ngulia, Kenya. *Ibis* 118: 78–105.
Benson, C. W., Brooke, R. K., Dowsett, R. J. & Irwin, M. P. S. 1971. *The Birds of Zambia* p. 234. London: Collins.
Dowsett, R. J. 1972. The River Warbler, *Locustella fluviatilis*, in Africa. *Zam. Mus. Journ.* 3(1972): 69–76.
Mead, C. J. & Watmough, B. R. 1976. Suspended moult of trans-Saharan migrants in Iberia. *Bird Study* 23(3): 187–196.
Moreau, R. E. 1972. *The Palaearctic-African Bird Migration Systems* p. 98. London: Academic Press.
Stjernstedt, R. 1975. River Warbler, *Locustella fluviatilis*, near Lusaka. *Bull. Zam. Orn. Soc.* 7(1): 21.
Svenson, L. 1970. *Identification Guide to European Passerines* p. 66. Stockholm: Naturhistoriska Riksmuseet.

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Multiple original spellings of *Bradypterus* Swainson, 1837

by C. W. Benson, R. K. Brooke & Melvin A. Traylor

Received 22 December 1977

The generic name of *Bradypterus* has long been used for a widespread group of tropical old world warblers (Sylviidae), most of which frequent the dense edges of forests where they are difficult to study. Their generic name is almost invariably attributed to Swainson (1837, *On the Natural History and Classification of Birds* 2: 241). However, a re-examination of this text while framing a catalogue of the type specimens in the University Museum of Zoology, Cambridge, showed that the name that Swainson proposed was *Bradyptetus* (Greek for slow flier) and that *Bradypterus* (Greek for slow wing) only appears in the index on p. 379. The problem was expanded, since the name Swainson gave in his own handwriting on the type specimen of the genotype is *Bradypetes platyurus* (actually a junior synonym of *Sylvia baboecala* Vieillot, 1817: 172). *Bradypetes* also means slow flier in Greek, but, being a cheironym, has no standing in zoological nomenclature. The next author to allude to the genus was Gray (1840, *A List of the Genera of Birds*: 20), who called it *Bradypterus* Swains. without comment, a practice which has been followed almost universally ever since.

We are the first workers to set out this case of multiple original spellings, and in the light of Recommendation 24A of the International Code of

Zoological Nomenclature we select *Bradypterus* as the correct original spelling of the generic name that Swainson erected for his species *platyurus* (=*Sylvia baboecala* Vieillot, 1817), since this is the form almost universally used, and despite its inappropriateness and publication in an index.

We are obliged to Mr. R. V. Melville, Secretary to the International Commission on Zoological Nomenclature, for advice on how to proceed in this case.

Addresses: C. W. Benson, Dept. of Zoology, Downing Street, Cambridge CB2 3EJ, England;

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Melvin A. Traylor, Field Museum of Natural History, Roosevelt Road at Lake Shore Drive, Chicago, Illinois 60605, U.S.A.

The interorbital septum in cardueline finches

by R. L. Zusi

Received 29 October 1977

The Carduelinae (*sensu* Howell, Paynter & Rand *in* Peters 1968) are a well-defined group of finches that differ from other finches in various aspects of their anatomy and behaviour (for discussion and references see Mayr *et al.* 1956, Ziswiler 1965, Ackermann 1967). Some of the genera presently included in the Carduelinae have been little studied and are placed in that subfamily because of their external similarity to better-known carduelines, or because of their geographical distribution. This paper deals with the interorbital septum of the skull as a clue to the relationships of some controversial genera. Because the septum can be seen in most museum skins by removal of cotton from the eye or by radiographs, it can be studied in species for which anatomical specimens are not available.

The conformation of the interorbital septum in species known to be cardueline differs consistently from that in conical-billed species known to be non-cardueline. To evaluate species of controversial affinity I have assumed that those with the cardueline type of septum belong in that subfamily, or within another group derived from the Carduelinae. Use of a single character for tentative taxonomic conclusions is here justified by the apparent consistency of the character and by the lack of other strong evidence for some species.

For this study I have examined skeletons of heavy-billed or broad-billed forms in a wide variety of passerine families and subfamilies, including the Thraupinae, Tersininae, and Icteridae, and most of the genera (from Peters 1962, 1968, 1970) of the following (the number of genera *not* studied is given after each taxon): Emberizinae (–17), Catamblyrhynchinae (–0), Cardinalinae (–2), Drepanididae (–5), Fringillinae (–0), Carduelinae (–0), Estrildidae (–9), Viduinae (–0), Bubalornithinae (–0), Passerinae (–2), Ploceinae (–1). I use the word "finch" broadly to include conical-billed members of these groups.

The interorbital septum is the median partition lying between the eyes, extending from the brain case foward to the ectethmoid bones. In most finches there is a fenestra in the anterior cranial wall above each optic foramen. When the bony septum is complete, these cranial fenestrae are

restricted to the cranial wall and there is no opening in the septum; this is the condition found in all Carduelinae and in some members of the Emberizinae, Cardinalinae, Drepanididae, Estrildidae and Ploceidae. In the Fringillinae, Icteridae, Thraupinae, and some members of the other groups (except Carduelinae) the bony septum is incomplete because of forward intrusion of

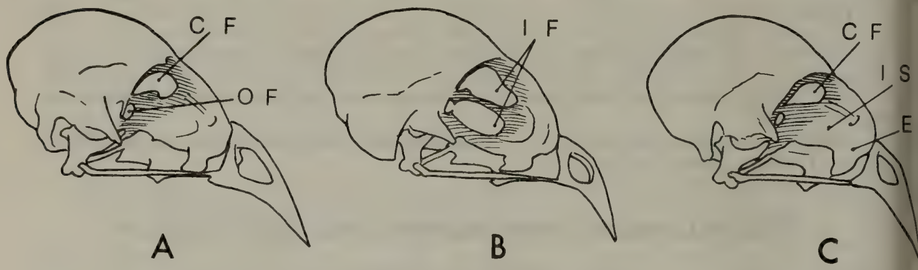

Figure 1. Skulls of finches showing differences in interorbital septa. A, *Passer domesticus*; B, *Spizella pusilla*; C, *Carduelis tristis*. CF, cranial fenestra; E, ectethmoid; IF, interorbital fenestra; OF, optic foramen; IS, interorbital septum.

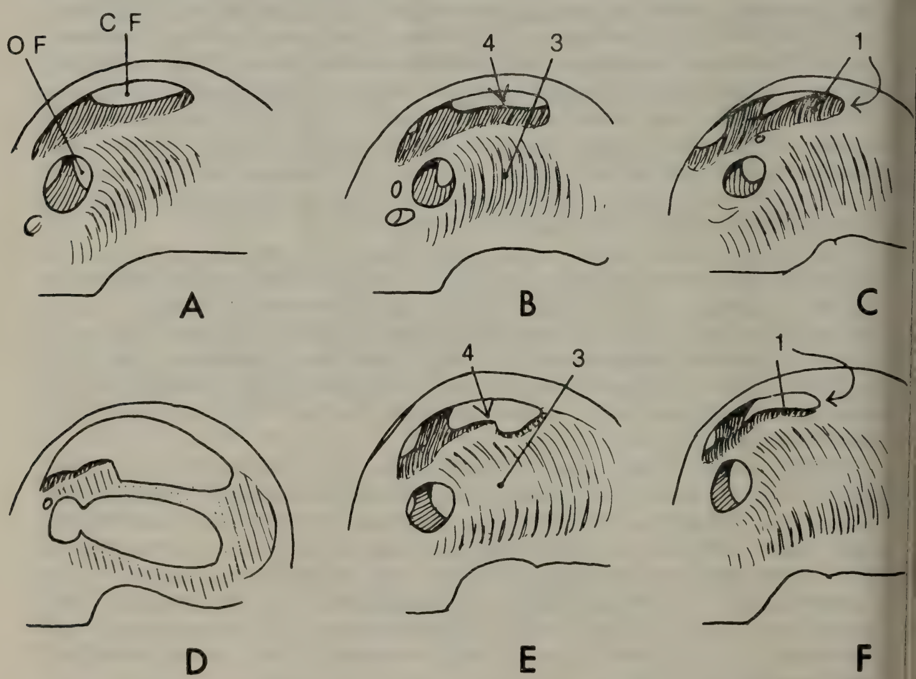

Figure 2. Anterodorsolateral views of interorbital septa of various finches drawn to similar size. A, *Carduelis tristis*; B, *Carpodacus purpureus*; C, *Coccothraustes vespertinus*; D, *Spizella pusilla*; E, *Passer domesticus*; F, *Cardinalis cardinalis*. Each skull above is of similar actual size to the skull directly below. Numbers 1, 3 and 4 illustrate features described in text. GF, cranial fenestra; OF, optic foramen.

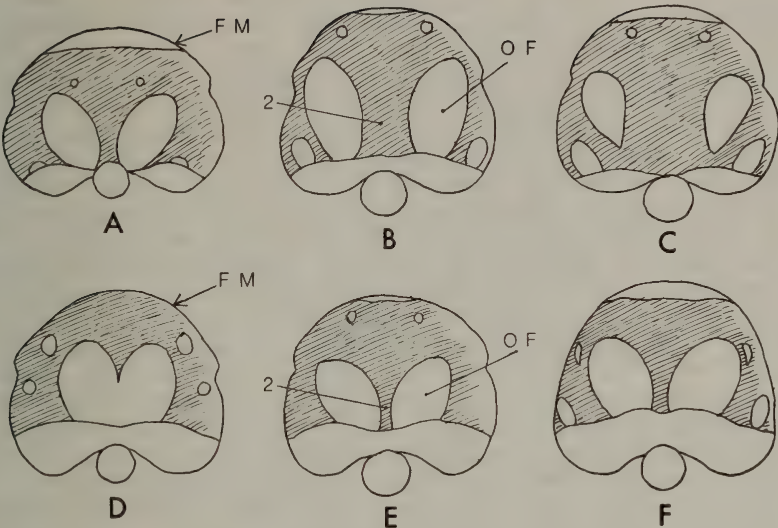

Figure 3. Posterior edge of interorbital septum as seen through foramen magnum. A through F as in Fig. 2. Number 2 illustrates feature described in text. FM, edge of foramen magnum; OF, optic foramen.

the cranial openings onto the septum, forming interorbital fenestrae (Fig. 1), or because of the presence of an isolated interorbital fenestra. The septum in the Carduelinae is thicker than that of the non-cardueline of comparable cranial size. The following characteristics associated with the thicker septum can be used to distinguish the Carduelinae from other finches with a complete septum: (1) the anterior cranial wall (between the olfactory nerves) and the floor of the anterior part of the cranial cavity are broad and flat (somewhat ridged in larger species)—in non-carduelines they are narrow and ridge-like (Fig. 2), (2) the posterior edge of the septum between the optic foramina (visible through the foramen magnum) is usually broad—in non-carduelines it is usually narrow or knife-like (Fig. 3), (3) the septum is double-walled, hollow, and supported by internal bony trabeculae throughout—in non-carduelines it is usually thin in the middle where it becomes a single bony partition without internal cavity or trabeculae (Fig. 2), (4) the ventral border of the cranial fenestrae is usually straight from side view—in non-carduelines if often has a hump or dorsal projection (Fig. 2). Of these features only the first and third are entirely consistent throughout the carduelines, but all are found in many carduelines.

The structure of the interorbital septum reflects several other attributes of the skull and it may show convergent or parallel similarities in various finches. It tends to be thicker in birds capable of strong biting and in birds with broad bills. In order to avoid spurious taxonomic comparisons based on similar adaptations I compared birds of similar size and similar bill and cranial proportions. In all such comparisons I had no difficulty distinguishing the carduelines by the septum alone, or in placing birds of uncertain relationship into cardueline or non-cardueline categories. Even in "unfair"

comparisons—a relatively weak and narrow-billed cardueline (*Leucosticte tephrocotus*) with a powerful, broader-billed non-cardueline (*Oryzoborus crassirostris*), or a small species with a large species (*Serinus gularis* with *Malimbus nitens*) the cardueline septum was as thick as or thicker than that of the non-cardueline. The septum was clearly recognizable as non-cardueline in such strong-billed forms as *Geospiza magnirostris*, *Cardinalis phoenicea*, *Oryzoborus crassirostris*, *Passerina cyanoides*, *Pyrinestes ostrinus*, *Padda orizivora*, *Amblyospiza albifrons*, and *Anomalospiza imberbis*. *Tersina* has a broad bill, skull, and interorbital septum, but the posterior wall of the septum (2, Fig. 3) is narrow, unlike any cardueline with such a thick septum. Within the Carduelinae I have examined the interorbital septum in species representing all the genera and subgenera recognized in Peters, including members of the synonymized genera *Eophona*, *Warsanglia*, *Chloris*, *Pseudacanthis*, *Loximitris*, *Alario*, *Poliospiza*, *Kozlowia*, and *Propyrrhula*. Of these, only one genus, *Urocynchramus*, has a non-cardueline septum. I have not seen *Neospiza concolor*, a monotypic genus that is listed with the Carduelinae and also with the Ploceinae in Peters (1962, 1968) and is known from only 2 specimens. In no species of the other families and subfamilies of finches, except for the Drepanididae, did I find a cardueline form of the interorbital septum.

Several taxa deserve special comment: *Fringilla* differs from the carduelines in some behavioural and structural features, but it is usually included with them in the Fringillidae because of similarity in other attributes (for example, see Mayr *et al.* 1956, Ackermann 1967, Foelix 1970, Ziswiler 1967). *Fringilla* has a non-cardueline septum resembling that of the Emberizinae and it differs from the Carduelinae in other skull features discussed by Tordoff (1954). A discussion of its relationships lies beyond the scope of this paper.

H. Mendelssohn has suggested (Morony *et al.* 1975, and *in litt.*) that *Petronia brachydactyla*, usually placed in the Passerinae, should be transferred to the Carduelinae in the monotypic genus *Carpospiza* based on features of its nest, eggs, and young. I found the interorbital septum of a skin to resemble that of *Petronia petronia* and to differ from the Carduelinae in features 1 and 3.

Poliospiza was said by Tordoff (1954) to be related to the Passerinae based on a single skeleton in the collections of the Smithsonian Institution (USNM 347376). This skeleton was misidentified; it proves to represent a species of *Vidua*. I found skeletons of several species of *Poliospiza* to have typical cardueline septa and other skeletal features.

Chaunoproctus ferreorostris, the extinct Bonin Island finch, was suggested by Sushkin (1924) from external appearance to belong with the cardinalines. Taka-Tsukasa & Hachisuka (1925) by contrast, emphasized its close resemblance to *Pinicola subhimachalus*. Mayr & Amadon (1951) thought it closest to *Carpodacus*, and Ridgway (1901) earlier called it "a crass-billed Carpodacus". A radiograph of a skin (AMNH 306354) revealed a septum much like that of other large-billed carduelines in its distribution of trabeculae and unlike the heaviest-billed non-carduelines.

Urocynchramus pylzowi was described by Sushkin (1927) as "a typical bunting [Emberizinae] in all characters of external anatomy, structure of the horny palate included, but with long tenth primary". Vaurie (1956) felt that the shape of its bill did not necessarily indicate relationship with the emberizines; he thought that its rosy pigmentation was evidence for relationship with the rosefinches of the Carduelinae, and he placed it next to *Uragus*.

However, Paynter (in Peters 1968: 266) pointed out that "the presence of a bright color (scarlet) in the tail sets it apart from the rosefinches". I have determined that the silvery-pink ventral colour of *Urocynchramus* and of various carduelines is produced by red barbs and white, elongated barbules. Brighter red is associated with loss of the white barbules and thickening of the red barbs. Red barbs, white or grey barbules and a soft patina can also be found in a few of the tanagers and their relatives (*Coryphospingus cucullatus*, *Rhodothraupis celaeno*, *Habia rubica*, and *Piranga roseogularis*). Their pigmentation pattern probably evolved independently from that of the carduelines, and the possibility of convergence must also be considered when comparing *Urocynchramus* with the carduelines. The interorbital septum of a single skin (USNM 305680, adult male) though partly missing, is a thin, translucent sheet lacking trabeculae. This does not prove relationship with the emberizinae, but it does argue against inclusion of *Urocynchramus* in the Carduelinae.

Pyrrhoplectes is a monotypic genus placed at the end of the Carduelinae by Paynter (in Peters 1968: 305), who remarked that it may not be a cardueline. A radiograph and direct examination of the septum in a skin show the septum to be typically cardueline in all of the characters listed above except one—the presence of a slight hump on the floor of the anterior part of the cranial cavity, in which it resembles *Uragus* and some species of *Carpodacus*.

Sushkin's separation of species long thought to be closely related into unrelated groups—*Leucosticte* (Carduelinae) and *Montifringilla* (Ploceidae)—as discussed and confirmed by Tordoff (1954), is further borne out by the interorbital septa of these genera.

Nesospiza acunhae and *N. wilkinsi* of the Tristan da Cunha island group were considered to be near *Serinus* by Mayr & Amadon (1951) but were thought closest to American emberizines by others (see Rand 1955). The interorbital septa of these birds are not cardueline in form.

Sushkin (1929) suggested a cardueline origin for the Drepanididae on the basis of a variety of skull features (not including the interorbital septum). Amadon (1950) argued, largely from tongue structure, that the Drepanididae were derived from a coerebid or other New World 9-primaried group. Beecher (1953) believed that a generalized tanager stock gave rise to the Drepanididae, but pointed out that the jaw muscle patterns of *Carpodacus* and some Hawaiian honeycreepers were almost identical. The interorbital septa of *Psittirostra*, *Vestiaria coccinea*, *Palmeria*, *Pseudonestor*, and *Hemignathus* are typically cardueline; those of *Loxops* and *Himatione* differ in being thinner in the middle than those of carduelines, sometimes with a central fenestra in the septum. The thinner septa of these slender-billed genera were probably derived from an ancestor with a thicker, cardueline form of the septum because they retain the cardueline shape of the anterior cranial opening, a broader floor of that opening than is found in other slender-billed non-carduelines, and an unbroken vertical posterior edge of the septum between the optic foramina. Thus the interorbital septum adds to a growing body of evidence for a cardueline progenitor of the Drepanididae (see Bock 1972, Richards & Bock 1973, Raikow 1977) and supports Raikow's (1977) suggestion that the founder species had a finch-like bill.

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References:
Ackermann, A. 1967. Quantitative Untersuchungen an Körnerfressenden Singvögeln. *Journ. f. Orn.* 108: 430–473.
Amadon, D. 1950. The Hawaiian honeycreepers (Aves, Drepaniidae). *Bull. Amer. Mus. Nat. Hist.* 95: 151–262.
Beecher, W. J. 1953. A phylogeny of the oscines. *Auk* 70: 270–333.
Bock, W. J. 1972. Morphology of the tongue apparatus of *Ciridops anna* (Drepanididae). *Ibis* 114: 61–78.
Foelix, R. F. 1970. Vergleichend-morphologische Untersuchungen an den Speicheldrüsen Körnerfressender Singvögel. *Zool. Jahrb., Anat.* 87: 523–587.
Mayr, E. & Amadon, D. 1951. A classification of recent birds. *Amer. Mus. Novit.* 1496.
Mayr, E., Andrew, R. J. & Hinde, R. A. 1956. Die systematische Stellung der Gattung *Fringilla. Journ. f. Orn.* 97: 258–273.
Morony, J. J. Jr., Bock, W. J. & Farrand, J. Jr. 1975. Reference list of the birds of the world. *Amer. Mus. Nat. Hist.*
Peters, J. L. 1962. *Check-list of Birds of the World, vol. 15* (E. Mayr & J. C. Greenway, Jr., Eds.). Cambridge, Mass.: Mus. Comp. Zool.
— 1968. *Check-list of Birds of the World, vol. 14* (R. A. Paynter, Jr., Ed.). Cambridge, Mass.: Mus. Comp. Zool.
— 1970. *Check-list of Birds of the World, vol. 13* (R. A. Paynter, Jr., Ed.). Cambridge, Mass.: Mus. Comp. Zool.
Raikow, R. J. 1977. The origin and evolution of the Hawaiian honeycreepers (Drepanididae). *The Living Bird, 15th annual:* 95–117.
Rand, A. L. 1955. The origin of the land birds of Tristan da Cunha. *Fieldiana: Zool.* 37: 139–166.
Richards, L. P. & Bock, W. J. 1973. Functional anatomy and adaptive evolution of the feeding apparatus in the Hawaiian honeycreepers genus *Loxops* (Drepanididae). *Orn. Monographs 15. Amer. Orn. Union.*
Ridgway, R. 1901. Birds of North and Middle America, pt. 1. *Bull. U.S. Nat. Mus.* 50.
Sushkin, P. P. 1924. [On the Fringillidae and allied groups.] *Bull. Brit. Orn. Club* 45: 36–39.
— 1927. On the anatomy and classification of the weaver-birds. *Bull. Amer. Mus. Nat. Hist.* 72: 1–32.
— 1929. On the systematic position of the Drepanidae. *Verh. 6th Internat. Orn. Kongr.*, Kopenhagen, 1926: 379–381.
Taka-Tsukasa, N. & Hachisuka, W. V. 1925. A contribution to Japanese ornithology. *Ibis:* 898–908.
Tordoff, H. B. 1954. A systematic study of the avian family Fringillidae based on the structure of the skull. *Misc. Pub. Mus. Zool.*, U. Michigan 81.
Vaurie, C. 1956. Systematic notes on Palearctic birds. No. 20 Fringillidae: the genera *Leucosticte*, *Rhodopechys*, *Carpodacus*, *Pinicola*, *Loxia*, *Uragus*, *Urocynchramus*, and *Propyrrhula*. *Amer. Mus. Novit.* 1786.
Ziswiler, V. 1965. Zur Kenntnis des Samenöffnens und der Struktur des hörnernen Gaumens bei körnerfressenden Oscines. *Journ. f. Orn.* 106: 1–48.
— 1967. Vergleichend morphologische Untersuchungen am Verdauungstrakt körnerfressenden Singvögel zur Abklärung ihrer systematischen Stellung. *Zool. Jahrb., Syst.* 94: 427–520.

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An analysis of avian stomach contents from southern Africa

by W. R. J. Dean

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The standard reference books on African birds give generalised statements about the diet of most birds, but for few of them are the arthropod orders and families eaten identified.

From June 1972 to July 1973 a number of birds were collected in South

West Africa, South Africa and Rhodesia as part of a research project on the blood and eye-lens proteins of birds. Stomach contents from some of these specimens, and from road casualties, were preserved, and have now been analysed. Most specimens were dissected shortly after collection and the contents of the gizzard and crop were preserved in 70% ethanol. However, in a number of cases, the time lag between collection and dissection was sufficient for friable and small food items to digest or become anonymous.

The stomach contents of each specimen are given in Table 1. None of the identifications was unexpected or unusual, but as noted earlier, there are few comparative data.

Avian nomenclature follows McLachlan & Liversidge (1970) and insect taxonomy follows Smart (1962).

TABLE 1

Analysis of stomach contents of birds collected in South West Africa (SWA), South Africa (SA) and Rhodesia (R), June 1972 to July 1973. Numbers indicate the number of individuals or species recognised. The stomach contents from two individuals of the same species collected at the same locality within 30 minutes of each other have been pooled. L=larva(e), W=worker, A=adult.

Species	*Locality, Date*	*Order*	*Family*	*Species & Number*
Vanellus	Kimberley, SA	Isoptera	Hodotermitidae	*Hodotermes mossambicus* 7W
coronatus	4.vii.73	Coleoptera	Curculionidae	3
		Coleoptera	Tenebrionidae	1
				Fragments of 4 Coleoptera spp.
		Hymenoptera	Formicidae	Fragments of 3 individuals
Cursorius	Kimberley, SA	Isoptera	Hodotermitidae	*H. mossambicus* 20W
rufus	3.vii.73	Coleoptera	Curculionidae	1
				Coleoptera fragments+2L
		Hymenoptera	Formicidae	27+
		Diptera		1
Cursorius	Kimberley, SA	Isoptera	Hodotermitidae	*H. mossambicus* 17W
rufus	5.vii.73	Coleoptera	Tenebrionidae	1
				Coleoptera fragments
Rhinoptilus	Kimberley, SA	Isoptera	Hodotermitidae	*H. mossambicus* 20W
africanus	2.vii.73	Coleoptera		Fragments
		Hymenoptera	Formicidae	Fragments
Otus scops	Erongo Mts., SWA	Scorpionidea		1
	26.iv.73	Orthoptera	Gryllidae	Fragments
		Coleoptera		Fragments of 3 spp.
Glaucidium	Erongo Mts., SWA	Lepidoptera		1A, 3L
perlatum	28.iv.73	Coleoptera		Fragments
Tockus	Humani Ranch, R	Solfugidea		1
erythrorhynchus	27.xii.72			seeds
Tockus	Humani Ranch, R	Hymenoptera	Formicidae	numbers
erythrorhynchus	27.xii.72			
Tockus	Humani Ranch, R	Orthoptera	Acrididae	1
alboterminatus	19.xii.72	Hemiptera	Coreidae	1
		Coleoptera	Cerambycidae	1
Tockus	Gamsberg, SWA	Orthoptera	Acrididae	7
monteiri	19.iv.73	Lepidoptera		1L
		Coleoptera		Fragments of 12
				Large seeds
Indicator minor	Erongo Mts., SWA	Araneida		1
Two stomachs	26.iv.73	Isoptera	Hodotermitidae	*H. mossambicus* W
		Coleoptera		Fragments
		Hymenoptera	Formicidae	5
Mirafra	Kimberley, SA	Coleoptera		1
sabota	28.ii.73			seeds
Mirafra	Kimberley, SA	Isoptera	Hodotermitidae	*H. mossambicus* 10W
apiata	4.vii.73	Hymenoptera	Formicidae	head capsules
				seeds
Chersomanes	Kimberley, SA	Isoptera	Hodotermitidae	*H. mossambicus* 10W
albofasciata	2.vii.73	Coleoptera	Carabidae	1
		Coleoptera	Chrysomelidae	1L
		Coleoptera	Curculionidae	2
				seeds
Calandrella	Kimberley, SA	Isoptera	Hodotermitidae	*H. mossambicus* 9W
cinerea	2.vii.73	Hymenoptera	Formicidae	Fragments
Parus afer	Kimberley, SA	Lepidoptera		4L
	16.vii.73	Coleoptera		Fragments
		Hymenoptera		Fragments

TABLE 1 *Continued*

Species	*Locality, Date*	*Order*	*Family*	*Species & Number*
Cossypha	Kimberley, SA	Coleoptera		Fragments
caffra	13.vii.73	Hymenoptera	Formicidae	3+
Erythropygia	Kimberley, SA	Hemiptera	Pentatomidae	10+
paena	17.vii.73	Hemiptera	Lygaeidae	2
		Lepidoptera		1L
		Coleoptera	Curculionidae	1
		Coleoptera	Ptilidae	1
		Hymenoptera	Formicidae	3
				seeds
Farisoma	Kimberley, SA	Araneida		1
subcaeruleum	1.iii.73	Lepidoptera		5L, 2 spp.
		Hymenoptera	Formicidae	4
Eremomela	Kimberley, SA	Hemiptera	suborder Homoptera	1
icteropygialis	17.vii.73	Lepidoptera		1L
		Coleoptera		Fragments
Malcorus pectoralis	Kimberley, SA	Hemiptera		Fragments
Two stomachs	6.vi.72	Coleoptera	Curculionidae	Fragments
Malcorus pectoralis	Kimberley, SA	Isoptera	Hodotermitidae	*H. mossambicus* 3W
Two stomachs	18.vii.73	Hemiptera	Pentatomidae	3
		Coleoptera	Curculionidae	2, 2 spp.
		Coleoptera		Fragments
		Hymenoptera	Formicidae	3
Malcorus	Kimberley, SA	Isoptera	Hodotermitidae	*H. mossambicus* 6W
pectoralis	19.vii.73	Lepidoptera		2L
		Coleoptera		Fragments
Cisticola	Kimberley, SA	Araneida		2
aridula	19.vii.73	Orthoptera		Fragments
		Hemiptera	suborder Homoptera Jassidae	3
		Hemiptera	suborder Homoptera	3
		Hemiptera	suborder Heteroptera	2
		Diptera	suborder Nematocera	1
Prinia	Kimberley, SA	Araneida		1
*flavican*s	6.vi.72	Hemiptera	suborder Heteroptera	12
		Hemiptera	Pentatomidae	12
		Lepidoptera		4L
		Coleoptera		Fragments
		Hymenoptera	superfamily Chalcidoidea	1
				2
Prinia	Kimberley, SA	Hemiptera	Lygaeidae	Fragments
flavican	17.vii.73	Coleoptera	Coccinellidae	1
		Coleoptera		Fragments
		Hymenoptera	Formicidae	Fragments
		Pseudoscorpionidea		1
Stenostira	Kimberley, SA	Hemiptera		1
scita	21.vii.73	Coleoptera		1
		Hymenoptera	Chalcidoidae	1
		Hymenoptera		Fragments
		Diptera		10+
Bradornis infuscatus	Kimberley, SA	Isoptera	Hodotermitidae	*H mossambicus* 26W
Two stomachs	18.vii.73	Hemiptera		Fragments
		Coleoptera		Fragments
		Hymenoptera	Formicidae	*Messor* spp. + 1 other genus
Anthus	Kimberley, SA	Orthoptera	Acrididae	1
novaeseelandiae	11.vii.73	Hemiptera	Coreidae	1+
Two stomachs		Hemiptera	Pentatomidae	17
		Lepidoptera		1A
		Coleoptera	Chrysomelidae	1
		Coleoptera		Fragments of 6+spp.
		Hymenoptera		Fragments
Anthus	Kimberley, SA	Isoptera	Hodotermitidae	*H. mossambicus* 16W
vaalensis	26.ii.73	Coleoptera		Fragments
		Hymenoptera	Formicidae	3+
		Myriapoda		Fragments
Lanius collaris	Kimberley, SA 20.vii.73	Coleoptera		Fragments
Eurocephalus	Erongo Mts., SWA	Isoptera	Hodotermitidae	*H. mossambicus* 19W + 1 soldier
anguitimens	25.vi.73	Coleoptera	Scarabeidae	2
		Coleoptera		Fragments
		Hymenoptera	Formicidae	3
		Hymenoptera	Vespidae	1

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References:
McLachlan, G. R. & Liversidge, R. 1970. *Roberts Birds of South Africa.* Central News Agency: Cape Town.
Smart, J. 1962. *Instructions for Collectors.* No. 4a, Insects. Trustees of the British Museum: London.

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Remarks on the generic allocation of *Pseudochelidon sirintarae*

by R. L. Zusi

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In 1968 Kitti Thonglongya described a new swallow, *Pseudochelidon sirintarae*, from Thailand (Thonglongya 1968). Its relationship with *Pseudochelidon eurystomina* of Africa was suggested to him by similarities of plumage, bill, and feet, and by comments of Peter Ames on its syringeal structure. The syringeal structure of the 2 species of *Pseudochelidon* differed enough from that of the Hirundininae to suggest at least subfamily distinction from the true swallows (Mayr & Amadon 1951, Ames, *in* Thonglongya 1968). Apart from the peculiarities that link the 2 species in a subfamily of their own, Thonglongya (1968: 7) commented that "the differences in size and shape of bill, the ridge between the nasal apertures, the size and strength of the feet, and the tail racquets, coupled with the geographic separation, might suffice to separate the 2 species into different genera". He nevertheless placed *sirintarae* in *Pseudochelidon* after interpreting the evidence in line with current taxonomic trends.

Recently, Brooke (1972) discussed generic limits in Old World Apodidae and Hirundinidae. He proposed raising a number of subgenera to genera, resurrected several genera (but see Phillips 1973), and named a new genus—*Eurochelidon*—in the Pseudochelidoninae, for *sirintarae*.

The basis for Brooke's new genus was a comparison by him of the skins of both *eurystomina* and *sirintarae* at the Smithsonian Institution, and measurements of both species presented by Thonglongya. Brooke made no comment on plumage differences, but he stated that "the differences in the shape and proportions of the bill and mouth show that they have very different feeding ecologies, *sirintarae* probably being able to take much larger prey and perhaps in different microhabitats" (Brooke 1972: 55). He then justified the new genus on differences in morphology, inferred ecology, and zoogeographic region. I think the following remarks cast doubt on this decision.

According to my measurements of a skin and spirit specimen of *sirintarae* and 2 skins and a spirit specimen of *eurystomina* in the Smithsonian Institution's collections, differences in bill proportion are much less marked than indicated by Thonglongya's data. In *eurystomina* the commissure is partly obscured by feathers whereas in *sirintarae* it is entirely exposed; apparently Thonglongya measured "bill from gape" and "width at gape" from the point where feathers obscured the commissure in *eurystomina* rather than from the angle of the mouth. His measurements of *sirintarae* consequently indicate a bill "more than half as wide again at gape, (and) half as long again" as that of *eurystomina* (Thonglongya 1968: 4). My measurements of the bill of 2 skins of *eurystomina*, all taken from the angle of the mouth, are

13·7, 13·5 (width) and 18·2, 18·5 mm (length). Comparing the average of 7 skins of *sirintarae* measured by Thonglongya with my measurements of *eurystomina*, *sirintarae* has a bill that is only 17·6% wider and 12·5% longer (i.e., difference as % of smaller measurement). In the 2 spirit specimens available to me (in which the rictus is not dried and shrunken as in skins), the bill of *sirintarae* is 22·5% wider.

To judge from wing measurements and appearance of the specimens, the 2 species of *Pseudochelidon* are similar in body size and the bill of *sirintarae* is thus proportionately longer and wider than that of *eurystomina*. However, the differences are less than was stated by Thonglongya and they are not greater than intrageneric differences in bill proportions found in some true swallows (*Tachycineta bicolor* and *T. albiventris*; *Riparia riparia* and *R. cincta*).

Thonglongya called the feet and claws of *sirintarae* "stronger and more robust" than those of *eurystomina*, but I can see no prominent difference. My measurements of single spirit specimens of each species suggest that by comparison, *sirintarae* has a slightly shorter tarsus, longer middle toe and claw, and similar hind toe and claw.

Thonglongya showed that the tail of *sirintarae*, excluding the elongated rachis, is shorter than that of *eurystomina* (averaging 42 and 52 mm respectively). Comparable differences can be seen in other congeners of similar size in the Hirundinidae—*Hirundo smithii* and *H. lucida*. In both comparisons the shorter tail is found in the species having long filamentous extensions of 2 rectrices (not included in the measurement).

Brooke used as one of his generic criteria the restriction of the 2 species to different zoogeographic regions. However, within the Hirundininae we find congeners with somewhat comparable distributions (*Hirundo angolensis* and *H. tahitica*; *Ptyonoprogne fuligula* and *P. concolor*). Berlioz (1970) cited other examples of congeners restricted to Africa and Southeast Asia, including sedentary forest birds (*Trichastoma*, *Pitta*). Another parallel case is that of the 2 species of bay owls (*Phodilus*)—the sole representatives of the subfamily Phodilinae. One (*prigoginei*) is restricted to the highlands of central Africa, and the other (*badius*) occurs from India through Southeast Asia to the Malay Archipelago.

Many points of difference between *sirintarae* and *eurystomina* are of the sort that characterise congeneric species in swallows or other families (*sirintarae* characters listed first): eye and eye-ring white, eye red and eye-ring pink; bill greenish yellow with black tip, bill orange-scarlet with yellow tip; rictus exposed, rictus hidden by feathers; feet flesh-coloured, feet brownish-pink; rump white, rump black; wing-lining light brown, wing-lining sooty brown; central rectrices with very long filamentous rachis, central rectrices with very short filamentous rachis. When these differences are eliminated some striking similarities remain. Both species have black heads, contrasting sharply with a browner mantle that is identically glossed with soft green in *sirintarae* and some specimens of *eurystomina* (many *eurystomina* are more purplish). The rump and upper tail coverts are blacker than the mantle and abruptly demarcated from it in *eurystomina*; in *sirintarae* the upper tail coverts are black as in *eurystomina* but the demarcation from the mantle is a transverse white band (rump). Ventrally the species are identical in colour and sheen. These detailed similarities of colour and pattern in the 2 species have not been emphasized in previous descriptions.

I must conclude that the evidence at hand does not justify the proposal of a new genus for *Pseudochelidon sirintarae*.

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References:

Berlioz, J. 1970. Remarques sur les affinités des avifaunes forestières en Asie et Afrique tropicales. *Nat. Hist. Bull. Siam Soc.* 23(3): 249–254.

Brooke, R. K. 1972. Generic limits in old world Apodidae and Hirundinidae. *Bull. Brit. Orn. Cl.* 92: 53–57.

Mayr, E. & D. Amadon. 1951. A classification of recent birds. *Amer. Mus. Novit.* 1496: 1–42.

Phillips, A. R. 1973. On the supposed genus *Petrochelidon*. *Bull. Brit. Orn. Cl.* 93: 20.

Thonglongya, K. 1968. A new martin of the genus *Pseudochelidon* from Thailand. *Thai. Nat. Sci. Papers*, Fauna Ser. 1: 1–10.

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Observations on the Seychelles Magpie Robin *Copsychus seychellarum*

by Jenny and Roger Wilson

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The Seychelles Magpie Robin *Copsychus seychellarum* was originally found on several islands of the Seychelles group (Newton 1867), but during the last 100 years its numbers and range have been drastically reduced and Frigate Island now maintains the last surviving population.

Frigate Island is an agricultural estate, producing copra, vegetables and fruit, but it has now been developed for tourism, regrettably with an airstrip and accommodation in the same limited area which supports the greatest number of Magpie Robins. We visited Frigate from 24 May to 1 June 1976 in order to carry out a census and obtain data of the Magpie Robin population. In the limited time available, our primary aim was to estimate whether the new developments were liable to jeopardise the survival of the species. Our resulting recommendations have been submitted in typescript to the British Section of the International Council for Bird Preservation. As the report has only a limited circulation and our observations add to the previously published information on the Seychelles Magpie Robin, we feel it is worthwhile presenting them here.

Frigate island

The Seychelles lie 1000 km northeast of Madagascar and c. 100 km south of the equator, covering 200 km² of the western Indian Ocean. Frigate Island (4° 35′ S, 55° 56′ E) is the most easterly of the group. It has an area of 700 ha and consists of a granite hill rising to 125 m at its highest point. The hill falls steeply into the sea around much of the island, but there are two flat areas on the coast, locally called 'plateaux'. The most extensive of these is on the east side where the main settlement and the airstrip are situated and most of the agriculture is carried out. The second plateau, at Grand

Anse on the west side of Frigate is much smaller. These two plateaux constitute less than 20% of the total land area of the island.

The vegetation of the main plateau is a mosaic of cultivated land and coconut plantation with many houses and gardens. There are several groves of large Breadfruit Trees *Artocarpus altilis* and a grove of Sangdragon *Pterocarpus indicus*, whilst there are many isolated trees scattered among the coconuts including *Annona*, *Eugenia*, *Citrus* spp, *Terminalia catappa* and *Hernandia sonora*. Grand Anse is largely coconut grove with a few tall trees and 2 houses. Two other occupied houses have cultivated land around them, one on the path to Anse Parc above the main plateau, the other at Anse Parc itself.

Most of the hilly area is wooded, in part densely so, especially in the north and central parts of the island. Conspicuous species include Banyan *Ficus bengalensis* and other *Ficus* spp, *Citrus* spp and Cashew *Anacardium occidentale*. Coconut plantations, with a bushy understory of Cocoplum *Chrysobalanus icaco*, cover the steep slopes dropping down to the sea, whilst there are many open rocky areas vegetated mainly with tall *Panicum* grass, Cocoplum and Sisal, *Agave* spp. To the south and east there are more open coconut groves with Cocoplum scrub and *Stenotaphrum* grassland.

Frigate has never been colonised by rats although mice are present. Cats, both domesticated and feral, were introduced c. 25 years ago but most if not all have since been exterminated.

The census and distribution

The method used was to locate a Magpie Robin, preferably an adult, and follow it for a period of up to an hour. During that time its encounters with other birds were recorded and the area in which it travelled marked on a map. The area covered by the adults was assumed to be within their territory and birds which were accepted without aggressive behaviour were assumed to be members of that territorial group.

High (1974) considered Magpie Robins to be non-territorial in their behaviour, although moving around in small family groups. However, we observed several aggressive encounters between groups of birds occupying adjacent areas, and this gave us the opposite view that the species is markedly territorial. The group encounters generally took the form of simple pursuit of intruders by one or more resident birds until the intruders had left. On 3 occasions encounters involved all the members of adjacent groups. Initially, members of the two groups flew at each other, displacing their opponents from their perches. After several minutes, during which the groups had moved to and fro several times over a short distance, one group became gathered in one tree and the other in a tree close by. During the encounter the adults repeatedly displayed, adopting an erect posture with the neck stretched vertically and bill held horizontally, the body feathers fluffed out and the wings slightly held from the body. Whilst in this stance, the birds rocked slowly forwards and backwards, cocking their tails as they did so. We supposed such encounters occurred at territorial boundaries whilst simple pursuit occurred after a territorial incursion.

We found 10 groups altogether each consisting of a pair of adults and in most cases a number of offspring, totalling 34 Magpie Robins (Table 1 and Fig. 1). Although we covered as much ground as possible, it is unlikely

TABLE 1

Age composition and numbers of birds in the territorial groups of Seychelles Magpie Robins *Copsychus seychellarum* observed on Frigate in late May 1976.

Group	*Adults*	*Immatures*	*Recent Fledglings*	*Nests*
1	2	1+1*	none	none
2	2	2	none	none
3	2	2	1	none
4	2	2	?	none
5	2	?	none	none
6	2	none	none	?
7	2	2	none	1 egg
8	2	1	none	none
9	2	1	none	none
10	2	none	1	none
Totals	20	12	2	1
Grand total	34+1 egg			

Notes.

* Of different ages.

Calls heard in the territory of group 4 may have indicated the presence of a concealed newly fledged chick. An immature seen briefly in the territory of group 5 may have belonged to that group, and the behaviour of the adults in group 6 suggested they may have had a nest. Two adult Magpie Robins seen in a territorial dispute with the adults of group 9 may have been from group 8 or from a territory we missed between groups 8 and 9.

that we found every Magpie Robin on Frigate: but we believe we located every occupied territory on the two plateaux. Seven of the 10 groups were on the main plateau and one group occupied the entire plateau of Grand Anse. The group around the house at Anse Parc was at sea level, but the area around the beach and house was not extensive enough to be called plateau. The remaining group was at an altitude of 25 m, again close to a house and gardens.

Fig. 1. Frigate Island, Seychelles. Topography and territories occupied by Magpie Robins *Copsychus seychellarum* in May 1976.

This distribution is similar to that reported by High (1974) in May 1973, whilst the virtual restriction of the Magpie Robin to the two plateaux was also noted in 1973 by Diamond (I.C.B.P. Report 1976). It is noteworthy that Newton (1867) only encountered the species near the coast on Praslin and Marianne.

Breeding

There is little information in the literature on breeding. In November 1867 Newton collected an immature bird on Marianne, but the gonadal development, of adult birds collected at the same time suggested that breeding would not take place for several months. Courtship has been described taking place in November (Lousteau-Lalanne 1962) and nest building was observed on Frigate in December (Vesey-Fitzgerald 1940). A photograph taken by Mr. P. Hutley in April 1976 shows an occupied nest, whilst another was reported later in the same month (M. D. England pers. comm.); and High observed a nest in May. Fledglings were also seen in April by the Bristol Seychelles Expedition (Gaymer *et al.* 1969). We ourselves found a nest and saw 2 pairs of adults with recently fledged young in late May. The evidence suggests a breeding season extending at least from December to June.

The nest we found was on a rotted out ledge in the trunk of a coconut palm. It was a bulky, untidy structure of coconut fibre with a neat unlined cup, similar in size and material to that described by Vesey-Fitzgerald (1940) from Alphonse. A hole in a citrus tree, described as a disused site, was shown to J.W. in January 1976. Newton also mentioned a disused site in the rafters of a house on Marianne, to which the bird gained access through a hole, and was told of birds breeding in rock crevices. Both Vesey-Fitzgerald and High reported nests in the crowns of coconut palms. Chick calls, which may have come from a nest, were heard in such a site in the territory of group 3. A recently fledged chick was found in the same territory 2 days later.

The nest we found contained 1 egg, which was not weighed or measured in order to minimise the risk of causing desertion. The base colour was olive blue, heavily speckled with olive brown. Egg colour must be very variable as both white (Lousteau-Lalanne 1962) and blue (Vesey-Fitzgerald 1940) have been recorded. The presence of 2 immatures of the same age in 4 out of 10 groups indicates that the clutch may commonly be 2 eggs. Both Vesey-Fitzgerald and Lousteau-Lalanne give the clutch size as 2.

Young birds were distinguished by maroon marbling on the white wing patch, as first described by Newton (1867). The recently fledged chicks stayed in the middle of the bushes in deep shade, fed by both parents with large insects carried to them in the bill. The chick responded to an approaching adult with a loud piping call. The older immature birds were freely foraging for themselves. The adults generally tolerated their presence although they occasionally drove them away for short distances. Our impression was that the older immature birds would not be tolerated for much longer.

Eight of the 10 groups definitely contained young of various ages. Three of the groups had young of dissimilar ages, whilst one group contained 2 young and 1 egg. This suggests that the Magpie Robin may have 2 broods in 1 season.

FEEDING METHODS AND PREY

Magpie Robins were frequently seen around kitchens and houses eating scraps. When feeding naturally, the birds generally seemed to stay on low perches, often in shade, for long periods followed by swoops onto prey on the ground and bouts of foraging. They usually foraged singly and had several methods of obtaining prey.

Ground foraging. This was the main means of obtaining food, at least in number of items taken and time spent engaged in it. The birds foraged over the ground in open areas or among leaf litter beneath the trees, picking prey off the surface of the ground or from under leaf litter and sparse herbs.

Gleaning. Insects were picked off foliage in the herb layer whilst ground foraging and also to a lesser extent from among the foliage low down in the tree canopies.

Fly-catching. Insects were occasionally taken on the wing, the bird flying from a perch and returning to the same or a similar perch after the attempt.

Swooping. The birds would swoop onto large prey from a perch and attempt to kill it quickly with blows of the bill. This method was particularly used against lizards.

Newton (1867), Lousteau-Lalanne (1962), Gaymer *et al.* (1969) and High (1974) all describe food items taken by the Magpie Robin. These include millipedes, insects obtained from among litter, winged termites, spiders and lizards. Our observations also showed that ground and litter dwelling invertebrates of all types figured prominently in the diet. Other food items whilst ground foraging included the double egg of a gecko (*Phelsuma* sp.), a small fish dropped by a Fairy Tern *Gygis alba* and a dead giant millipede, *Scaphiostreptus madecassus*, which was broken open.

Four lizard corpses were found which had been taken by Magpie Robins, the largest being a *Mabuya wrightii* with a body length, excluding the tail, of 10 cm. The lizards were attacked swiftly and killing was attempted by sharp vertical blows of the bill, but most attempts were unsuccessful. In all 4 corpses the tail had been eaten. The only other parts taken were those accessible through the cloaca, eyes and mouth. In only one case had the body wall been broken into and this was probably not done by the bird itself. Generally the body was left lying in the open partially eaten and in two instances the birds returned to the corpse later. All the corpses examined showed heavy bruising on the belly.

Grasshoppers were gleaned from low herbs and a large green grasshopper was taken from the canopy of a tree. A large flying insect, probably a mason wasp, was taken by fly catching.

VOICE

Apart from the chick begging call already mentioned, 3 other calls were distinguished.

Song. A quiet, very musical song was heard twice, given by single adults from low perches in the open.

"*Cicada*" *call.* A harsh, low, churring or buzzing was given in situations of apparent moderate anxiety, and was heard most frequently when an observer approached too close to a foraging bird or to a concealed fledgling. It was also heard just prior to a territorial encounter and when the nest was approached.

"*Pee*" *call.* A short, plaintive whistle was heard 3 times. The first, given by an adult, was heard when the nest we found was examined. The second was given by a foraging adult which, after calling, continued to forage apparently undisturbed. The third was given by an immature which was surprised when an adult suddenly flew at it. The young bird may have been an intruder.

Discussion

It is likely that the Seychelles Magpie Robin originally inhabited the native plateau forests, feeding in the leaf litter and nesting in the abundant niches and holes of undisturbed primary woodland. It has adapted well to the artificial environment of the cultivated plateaux on Frigate. As similar habitat exists on most of the islands where the Magpie Robin was once found, especially on Praslin and La Digue, it is probable that introduced predators perhaps in conjunction with human pressure, rather than alteration of the habitat, have been primarily responsible for the decline of the species. In 1965 the Bristol Seychelles Expedition could find only 8 Magpie Robins on Frigate (Gaymer *et al.* 1969) but since the extermination of cats High was able to count 38 birds in 1973, a figure comparable with our 1976 census of 34. Aride excepted, Frigate is the only island formerly occupied by Magpie Robins that has escaped invasion by rats. Aride however was infested by cats which have since been destroyed (Percy & Ridley 1955) but which were probably responsible for the extinction of the Magpie Robin there over 40 years ago. Over 100 years ago, Newton (1867) had noticed the adverse effect of introduced predators on the Magpie Robin population; and he also suggested that the Mynah *Acridotheres tristis*, an introduced species that is common on Frigate, could pose a threat. It is possible that it does so, although we obtained no evidence of Mynahs interfering with Magpie Robins in any way.

Our observations suggest that the adults with established territories have no difficulty in rearing offspring. They also suggest that the hill provides an unsuitable habitat, for unknown reasons. As the present occupied territories almost completely cover the available ground on the main plateau, Grand Anse and Anse Parc, it is possible that Frigate can support few more Magpie Robins and that lack of space is limiting the population. Immature birds in this situation could either wait to replace a dead adult or could attempt to form territories in unsuitable areas where they could not support themselves. Two Magpie Robins seen near the summit of the hill in November 1976 by Dr. D. W. Snow (pers. comm.) may have been an example of such an attempt. Such a situation implies a stable population, a suggestion supported by the population counts in 1973 and 1976.

It seems likely that the world population of the Seychelles Magpie Robin consists of about 10 breeding pairs, this number being kept fairly stable by recruitment from a constantly replenished pool of young birds and prevented from further increase by a lack of suitable habitat.

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References:
Gaymer, R. *et al.* 1969. The endemic birds of the Seychelles. *Ibis* 111: 157–176.
High, J. 1974. Seychelles Magpie Robin. *Wildlife* 16: 61.
International Council for Bird Preservation British Section. 1976. 5th Report on the Cousin Island Nature Reserve and other Islands 1973–1976.
Lousteau-Lalanne, P. 1962. Land birds of the granitic islands of the Seychelles. *Occ. Publs. Seychelles Soc.* 1: 22–31.
Newton, E. 1867. On the landbirds of the Seychelles Archipelago. *Ibis* Ser. 2(3): 335–360.
Ridley, M. W. & Percy, Lord W. 1955. The exploitation of seabirds in the Seychelles. *Colonial Res. Studies No.* 25: 1–78. H.M.S.O.
Vesey-Fitzgerald, D. 1940. On the birds of the Seychelles, 1. The endemic birds. *Ibis* Ser. 14(4): 480–489.

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A new bird for Burma—Pallas's Reed Bunting *Emberiza pallasi*

by P. R. Colston

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Between Feb 1901 and April 1902 Col. R. M. Meinertzhagen (1960) collected a number of birds in Burma and these are now in the process of being registered and incorporated into the main collection of study skins at the British Museum (Natural History), Tring. These included 3 small buntings, 2 ♂♂ and 1 ♀, from Mandalay and Maymyo (22° 05′ N, 96° 33′ E, some 40 km north-northeast of Mandalay), all of which he identified as Little Buntings *Emberiza pusilla*. Critical examination of the female, Reg. No. 1965–M–16392, taken at Maymyo on 22 March 1902 shows it to be an adult ♀ Pallas's Reed Bunting *E. pallasi*, in moult. This species has not previously been recorded from Burma. One of the 2 male Little Buntings was collected at the same locality the following day.

Pallas's Reed Bunting is not unlike a small Reed Bunting *E. schoeniclus*, which could equally well occur as a vagrant to Burma. I have compared it with the extensive series of both *E. schoeniclus* and *E. pallasi* at Tring, and both Dr. D. W. Snow and Derek Goodwin confirm my identification. Measurements are: wing 68 mm, tail 52 mm, tarsus 17 mm, bill from base of feathers 7·5 mm. No soft part colours are recorded on the collector's label. The specimen shows the diagnostic pale whitish rump and upper tail coverts and the tail pattern which clearly separates it from female or immature Little Buntings.

Vaurie gives the range of *E. pallasi* as "Central and eastern Siberia, Outer Mongolia and probably northwestern Manchuria, also Tian Shan in Chinese Turkestan. Migratory, winters in Outer and Inner Mongolia, Manchuria, Korea, Ussuriland, and northern China south to lower Yangtze". According to Dementiev *et al.* *E. pallasi* occupies tundra overgrown with under-brush, dwarf birch, rose willow etc. In the south it is found predominently in mountains—in the subalpine zone, mostly at 2200–2400 m. It winters on plains, preferring irrigated areas with shrub and reed thickets, near rivers and lakes. In its winter quarters in northern China and southern Manchuria it is recorded as abundant. Pallas's Reed Bunting is a roaming and migratory bird, similar in this respect to the Little Bunting, which occupies much the same biotope.

The Crested Bunting *Melophus lathami* is the only resident bunting in Burma, but Smythies (1953) lists 8 winter visitors, i.e. *Emberiza aureola, cia, elegans, furcata, pusilla, rutila, spodocephala* and *tristrami*.

References:
Dementiev, G. P. & Gladkov, N. A. 1954. *The Birds of the Soviet Union*. Moscow: Sovetskaya Nauka.
King, B., Woodcock, M., & Dickinson, E. C. 1975. *A Field Guide to the Birds of South-East Asia*. Collins.
Meinertzhagen, R. 1960. *Army Diary 1899–1926*. Oliver & Boyd.
Smythies, B. E. 1953. *The Birds of Burma*. 2nd (revised) Ed. Oliver and Boyd.
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Ethiopia as a presumed wintering area for the eastern Grasshopper Warbler *Locustella naevia straminea*

by J. S. Ash

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The occurrence of the eastern race of the Grasshopper Warbler, *Locustella naevia straminea*, in Ethiopia has been reported on by Ash & Watson (1974). Since then I have captured 6 more birds, 2 from the earlier site at Koka (8° 27′ N, 39° 06′ E) at 1445 m; 3 at 1280 m from Aseita (11° 33′ N, 41° 26′ E), which is only 4 km north of the locality where Guichard (1948) collected one in 1947; and I netted one more on Debre Mariam Island (11° 38′ N, 37° 26′ E) in Lake Tana at 1825 m. Olson (1976) recorded 2 more near Bahar Dar (11° 35′ N, 37° 25′ E) at 1825 m, about 5 km south of my Debre Mariam site, and one from 4 km south of Gondar at 12° 37′ N, 37° 28′ E. Table 1 gives the dates, measurements and weights of these 10 records.

TABLE I

Details of the 10 *Locustella naevia straminea* records in Ethiopia

Locality	*Date*	*Sex*	*Wing (mm)*	*Tail (mm)*	*Weight (gm)*	*Time*	*Moult*	*Observer*
Abroberifaghe (Harar)	12 ii 47	—	—	—	—	—	—	Guichard 1948
Koka (Shoa)	24 ii 73	—	62	—	10·2	1130	o	Ash & Watson 1974
Gondar (Begemdir)	24 xi 73	?	62	54	14·3	a.m.	o	Olson 1976
Bahar Dar (Gojjam)	27 ii 75	♀	61	56	15·4	—	o	Olson 1976
Koka (Shoa)	15 ix 75	—	62	—	11·0	0900	o	Ash
* ” ”	25 ix 75	—	58	—	11·9	1100	√	”
* ” ”	25 ix 75	—	58	—	11·0	1730	√	”
Aseita (Harar)	11 ii 77	—	—	—	12·1	—	o	”
” ”	14 ii 77	—	—	—	13·1	—	o	”
” ”	16 ii 77	—	—	—	11·9	—	o	”
†D. Mariam Is. (Gojjam)	31 iii 77	—	62	58	12·4	1000	o	Ash
† ” ” ” ”	3 iv 77	—	62	58	13·3	1830	o	”

Notes: * and † indicate birds are the same individuals. Full data for the Aseita birds were lost during my hasty evacuation from Ethiopia.

The breeding range of the eastern subspecies *straminea* extends from east Russia (*c.* 55° E) across the Kirghiz steppes to the Altai (*c.* 85° E), south to Transcaspia, Turkestan and Sinkiang (Williamson 1960). Apart from Ethiopia, *L. n. straminea* is known on passage or in winter quarters from Iran, Afghanistan and India (Williamson 1960), to which can be added one from Arabia (Ticehurst & Cheesman 1925).

The 10 birds in Ethiopia occurred in autumn between 15 September and 24 November, and in spring between 11 February and 3 April. It is just possible that the absence of December and January records indicates that the final wintering area lies in an undiscovered region further south, but the present evidence suggests that the wintering area for the eastern population of this species in East Africa lies in Ethiopia between 8° 27′ and 12° 37′ N and between 37° 25′ and 41° 26′ E, at an altitudinal range of 1250 to 2000 m.

The Ethiopian habitat varies somewhat from site to site: at Koka, from where there are 3 records, it is lakeside *Acacia/Balanites* bush with thick underlying cover; at Aseita, thick riverside *Acacia* woodland with dense underlying cover; near Bahar Dar, extensive lakeside beds of *Phragmites* and *Cyperus papyrus*; on Debre Mariam Island, open deciduous woodland with dense bushy areas near water; near Gondar, on a "brushy hillside" (Olson 1976); at Guichard's (1948) site, "in dense grass cover along the River Hawash".

No other weights other than those in Table 1 are available for *L. n. straminea*, which is smaller than the western form *L. n. naevia*, for which there are many data. Winter weights in February of 4 unfattened *straminea* range from 10·2 to 13·1 g (the specimen on 27 February at 15·4 g was fat). The Gondar bird on 24 November at 14·3 g would appear to be heavy for the time of year unless it was preparing for further migration. Williamson (1960) gives weights of 65 migrant *L. n. naevia* in England as ranging from 10·6 to 16·3 g (mean 13·1 g).

An indication of its frequency of occurrence in relation to other Palaearctic migrants at Koka was given by Ash & Watson (1974). In February 1977 the 3 Grasshopper Warblers captured at Aseita were included in a total of 487 migrants of 23 species, of which most were thought to be over-wintering in the 7-hectare netting area (Ash, in prep.). The bird on Debre Mariam Island was included in a total of 287 migrants of 17 species in an area of approximately 25 hectares, but at this time in March and April most of the regular migrants were all passing through.

Four of the 10 birds from Ethiopia have been collected: the first, by Guichard, is in the British Museum (BM 1947–31–8, specimen registered but still not located, *contra* Ash & Watson 1974), the next, by Ash at Koka, is in the Smithsonian Institution (USNM No. 552733), as are the 2 by Olson in the list above (USNM No. 569269 and USNM No. 569270). The others were ringed and released.

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References:

Ash, J. S. The migrant bird community of an Ethiopian woodland in mid-winter. *In prep.*
— & Watson, G. E. 1974. *Locustella naevia* in Ethiopia. *Bull. Brit. Orn. Cl.* 94: 39–40.
Guichard, K. M. 1948. Notes on *Sarothrura ayresi* and three birds new to Abyssinia. *Bull. Brit. Orn. Cl.* 68: 102–104.
Olson, C. 1976. Summary of field observations of birds from Begemder and Simien Province. *Walia* 7: 16–27.

Ticehurst, C. B. & Cheesman, R. E. 1925. The birds of Jabrin, Jafura, and Hasa in central and eastern Arabia and of Bahrain Island, Persian Gulf. *Ibis*, 12th Ser. (1): 1–31.
Williamson, K. 1960. Identification for Ringers. 1. The genera *Locustella*, *Lusciniola*, *Acrocephalus* and *Hippolais*. British Trust for Ornithology.

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Inland and coastal occurrences of Broad-billed Sandpipers *Limicola falcinellus* in Ethiopia and Djibouti

by J. S. Ash

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Probably because Broad-billed Sandpipers *Limicola falcinellus* are not easily identified in non-breeding plumage, their wintering areas are still poorly known. In Ethiopia, Urban & Brown (1971) were only able to cite a single occurrence, the 2 females collected by Smith (1955) on 12 May 1953 at Massawa, Eritrea, on the Red Sea coast.

I am now able to add 4 new records (below), of which the first 3 are from Ethiopia and the last from Djibouti. There are no previous records from Djibouti.

Locality	*Coordinates*	*Dates*	*Numbers*
Assab area, Eritrea (coastal)	13° 02′ N, 42° 45′ E	25.xii–1.i.71	12+
Koka, Shoa (inland)	8° 27′ N, 39° 06′ E	22–29.x.74	1
Koka, Shoa (inland)	Same as above	14–15.ix.75	1
Djibouti (coastal)	11° 35′ N, 43° 11′ E	25.xii.75	3

The 1974 bird caught on 28 October weighed 29·1 g at 1500 LMT, wing 104 mm, bill from skull 36 mm. The 1975 adult in alternate (breeding) plumage caught on 14 September weighed 24·9 g at 1530 LMT, wing 104 mm. I have 2 other probable records from inland Ethiopia, at Lake Basaaka (8° 54′ N, 39° 52′ E) on 15 November 1969 (Ash 1972) and at Mataca (10° 00′ N, 40° 34′ E) on 11 October 1972.

Meinertzhagen (1954) states that the species is fairly common on the Egyptian and Sinai coasts, birds arriving there as early as 5 August; otherwise he only mentions some birds from Aden (mentioned below), and states that many had been obtained at Fao (at the head of the Persian Gulf) in August and September. Large numbers, up to 500 in a flock, are recorded from Aden (Browne 1949, 1955, Nisbet 1961, Paige 1960), but there are no records from Somalia (Archer & Godman 1937).

Elsewhere in Africa south of the Sahara, the Afrotropical region of Crosskey & White (1977), records are scattered, except that in Kenya numbers, up to 38 together, have now been seen annually both inland and on the coast since the Hopsons (1972) first recorded the species there (Backhurst *in litt*, Britton 1974, Britton & Britton 1973, 1976, EANHS 1977, Hopson & Hopson 1972, 1973). These Kenyan birds have been seen between 2 August and 8 April, with up to 33 in one coastal locality in midwinter. K. D. Smith, who summarizes the occurrences in Moreau (1972), refers to one in Nigeria (Dowsett 1968), one in Uganda, where there are now 2 occurrences

(Backhurst *et al.* 1973), 2 in Tanzania (Reynolds 1965, Harvey 1971), and doubtful records from Senegal and southwest Africa (although the latter is accepted by Winterbottom 1971). I was unable to find this species in December and January on the Red Sea coasts around Al Hodeida in Yemen (December 1975 to January 1976), or near Massawa in Eritrea in December 1972, although at both places suitable habitat exists. The scattered records of small numbers of Broad-billed Sandpipers are few and widespread, but judging by the large numbers passing through Aden in spring and autumn, it is almost certain that a midwinter concentration has yet to be discovered in some little worked area further south. A search of suitable habitat along the Somali coast may prove rewarding, particularly as there are midwinter records both to the north and south in Eritrea and Kenya.

At least in the areas where they are overwintering, this species has a preference for a distinctive type of foreshore—a combination of wet mud and sand with scattered stones and patches of weed. Once this habitat is recognized the birds may be found quite easily, and such was the case on 19 September 1976 at the mouth of the Sabaki River, on the Kenya coast, when a stop was made to look at a likely patch of tidal mud and the first bird seen was *L. falcinellus*.

This species is not difficult to identify. Useful additional field characters to those given in European field guides and by Browne (1955) include the following: the size is intermediate between Little Stint *Calidris minuta* and Curlew Sandpiper *C. ferruginea*; the bill appears to be too heavy for the bird to carry as it walks, and it is long (longer than the head) for the size of the bird; its legs are much shorter than those of Dunlin *C. alpina* and are not quite so dark, i.e., not quite black. It is always on the move when feeding and appears to be a "busier feeder" than a Dunlin, and whilst preening it constantly dips its bill in water.

Acknowledgements: I wish to thank Dr. G. E. Watson and G. C. Backhurst for commenting on this paper, and the latter for providing me with full data on the Kenyan records. Some of the observations were made whilst engaged in research supported in part by the Bureau of Medicine and Surgery and the Office of Naval Research under Contract No. N00014–67–A–0399–0009.

References:

Archer, G. & Godman, E. M. 1937. *The Birds of British Somaliland and the Gulf of Aden.* Vol. II. London: Gurney and Jackson.

Ash, J. S. 1972. Charadriiform birds in the Ethiopian Rift Valley. *Walia* 4: 14–18.

Backhurst, G. C., Britton, P. L. & Mann, C. F. 1973. The less common Palaearctic birds of Kenya and Tanzania. *Jl. E. African Nat. Hist. Soc.* 140: 1–38.

Britton, P. L. 1974. Broad-billed Sandpipers and Herring Gulls wintering on the north Kenya coast. *E.A.N.H.S. Bull.* 1974: 112–113.

Britton, P. L. & Britton, H. A. 1973. Broad-billed Sandpipers on the Kenya coast. *E.A.N.H.S. Bull.* 1973: 146–147.

Britton, H. A. & Britton, P. L. 1976. Records section (Birds). *E.A.N.H.S. Bull.* 1976: 52–61.

Browne, P. W. P. 1949. Notes on Broad-billed and Terek Sandpipers at Aden. *Brit. Birds* 42: 333–334.

Browne, P. W. P. 1955. Identification of the Broad-billed Sandpiper at Aden. *Brit. Birds* 48: 375–376.

Crosskey, R. W. & White, G. B. 1977. The Afrotropical Region. A Recommended term in Zoogeography. *J. Nat. Hist.*, 11: 541–544.

Dowsett, R. J. 1968. Broad-billed Sandpiper *Limicola falcinellus* at Lake Chad: a species new to Nigeria. *Bull. Orn. Soc. Nigeria* 5: 61.

E.A.N.H.S. Orn Sub-committee. 1977. Some recent records of Palaearctic birds in Kenya and Tanzania. *Scopus* 1: 39–43.
Harvey, W. G. 1971. The second Broad-billed Sandpiper for Tanzania. *E.A.N.H.S. Bull.* 1971: 161.
Hopson, J. & Hopson, T. 1972. Broad-billed Sandpiper at Lake Rudolf. *E.A.N.H.S. Bull.* 1972: 170–171.
Hopson, T. & Hopson, J. 1973. More Broad-billed Sandpipers at Lake Rudolf. *E.A.N.H.S. Bull.* 1973: 52.
Meinertzhagen, R. 1954. *Birds of Arabia.* Edinburgh and London: Oliver and Boyd.
Moreau, R. E. 1972. *The Palaearctic African Bird Migration Systems.* London and New York: Academic Press.
Nisbet, I. C. T. 1961. Studies of less familiar birds. 113. Broad-billed Sandpiper. *Brit. Birds* 54: 320–323.
Paige, J. P. 1960. Bird notes from Aden and Oman. *Ibis* 102: 520–525.
Reynolds, F. J. 1965. On the occurrence of Palaearctic waders in western Tanzania. *E. Afr. Wildl. J.* 3: 130–131.
Smith, K. D. 1955. Recent records from Eritrea. *Ibis* 97: 65–80.
Urban, E. K. & Brown, L. H. 1971. *A Checklist of the Birds of Ethiopia.* Addis Ababa: Haile Selassie I. University Press.
Winterbottom, J. M. 1971. *A Preliminary Checklist of the Birds of Southwest Africa.* S. W. A. Scientific Society.

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Sarothrura crakes in Ethiopia

by J. S. Ash

Received 11 October 1977

Of the 9 species of *Sarothrura* crakes, a genus confined to the African continent and Madagascar, 3 are known from Ethiopia. At the time when Keith *et al.* (1970) completed the monograph on the genus, with data up to the end of 1968, there were only single records of 2 of the 3 species, but several for the third. More information has since accrued, and the present knowledge of their occurence or absence in Ethiopia is given below. The order and nomenclature of Urban & Brown (1971) is followed, although more recently Ripley (1977) has placed all the *Sarothrura* crakes in the genus *Coturnicops*, in which Sclater (1930) placed *ayresi*.

SAROTHRURA AYRESI White-winged Crake

In the Republic of South Africa known only from single birds at 3 localities and from about 30 specimens in 4 localities in Ethiopia (the locality given as Entotto is a ridge of wooded hills, and almost certainly Sululta, which Entotto overlooks, is intended) (Keith *et al.*). The last certain records from South Africa were in 1901, where Keith *et al.* conjectured it had by then become extinct, and from Ethiopia in 1949. Keith *et al.* refer to an Ethiopian specimen with fully developed eggs on 18 July, and to an unfledged young bird on 22 September, so there can be no doubt that the species bred in this country. Firsthand references to the occurences of this species in Ethiopia are in Bannerman (1911), Gajdacs & Keve (1968), Guichard (1948, 1950). Urban & Brown call it resident and a possible intra-African migrant in the west and southwest highlands by streams and marshes, with breeding possibly occurring June-September.

There are no new data since Keith *et al.* From 1970 to 1976, I made many searches for this species at Gefersa and Sululta, in each year, at various times from July to October, and several other observers, including C. Erard (1974), Stuart Keith, Dr. Clark Olson, and Dr. S. J. Tyler, did the same, on occasions using dogs and up to 30 local beaters, without finding a trace of a bird. Many people visit Sululta to shoot Great Snipe *Gallinago media* and those questioned had no knowledge of these crakes. Similarly many local shepherd boys who tend their animals daily in this area were unaware of the bird. The marsh at Gefersa is now much reduced following the construction of a reservoir at the site, but Sululta marshes have probably remained unchanged in the past 30 years. There is always a chance that the species may be found again in the numerous other highland marshes in Ethiopia, but I have searched many without success, so that there is a distinct possibility that the species may be extinct in Africa.

SAROTHRURA RUFA Red-chested Crake

Widespread in Africa south of about 4° N, but very few north of this line (Keith *et al.*), and only one from Ethiopia (Guichard 1950). Urban & Brown describe the resident race *S. r. elizabethae* as rare in larger fresh-water lakes and rivers, and perhaps other grassy or marshy areas, in the west highlands (Gefersa). There are no breeding records.

Since 1970 there have been more records from 4 localities in Ethiopia. Two of these are noted with caution by Erard (1974), but in my opinion and that of Stuart Keith (*in litt.*), they are acceptable as undoubted *S. rufa*. All known records are listed below.

Locality	*Alt. (m)*	*Date*	*Numbers*	*Authority*
Gefersa, Shoa	2600	30 July 1947	1♀	Guichard 1950
Challa, Kaffa	1970	5–9 May 1971	several	Desfayes 1975
Gimbi (3 km E), Wollega	1850	28 Sept. 1971	1	Erard 1974
Didessa (6 km W), Wollega	1240	1 Oct. 1971	1	Erard 1974
Jimma airport, Kaffa	1700	24 June 1974	1	Keith (*in litt.*)
Didessa, Wollega	1262	1970–1976	several	Ash

The bird heard by Keith near Jimma was calling in the marshes at the airport; those seen by Desfayes were in very wet marshes at Challa.

After hearing Keith's tapes of their calls from elsewhere, I realized that I had heard *S. rufa* on many occasions in small marshes adjoining my regular campsite at Didessa, without recognizing at the time that they were those of a bird. I had been led to believe by the local people that it was a species of toad or frog, but Dr. M. L. Largen assures me that no anuran species known to him in Ethiopia or elsewhere calls in this manner.

SAROTHRURA ELEGANS Buff-spotted Crake

Range rather similar to that of *S. rufa* (Keith *et al.*) and only one record from Ethiopia (Benson 1974). Urban & Brown describe the resident race *S. e. elegans* as rare and found in the southeast highlands and south Ethiopia in Juniper-Podocarpus forest at 2400–3200 m.

Since 1970 there have been records from 4 more localities in southern Ethiopis, suggesting that the bird is locally, but widely and not uncommonly, distributed there. All known records are summarized overleaf.

Locality	*Alt.* (*m*)	*Date*	*Numbers*	*Authority*
Mega, Sidamo	?	4 June 1941	1	Benson 1947
Koffole, Arussi	2200	14 June 1968	1	Roux & Benson (1969)
Agaro, Kaffa	1670	June 1968	several	Erard 1974
Bulcha, Sidamo	1270	1970–1976	many	Ash
Belleta forest, Kaffa	2000	24 June 1974	1	Keith (*in litt.*)

Erard's 1968 birds near Agaro were claimed by him with reserve, but as he was familiar with the species' call in Gabon, and they resembled those of recordings of the species, his records are acceptable. In this area the birds were in forests of *Ficus sp*. Keith's bird near Jimma was in a thick bushy ravine in an area of mixed forest lacking *Podocarpus* and *Juniperus* but stated by him to be typical habitat.

At Bulcha I was familiar with the birds' calls for several years before identifying their origin. The local people believed them to be the calls of a tortoise, although several identified them as being the "King of Birds–a kind of nocturnal bird of prey which hunted from a low branch close to the ground". On hearing Keith's tape of *S. elegans* in 1974, I instantly recognized the identity of the unknown caller. Unfortunately, I do not have any notes on it prior to its identification, nor did I ever see one in the course of weeks of observation in areas where it was apparently fairly common. Birds mostly called at night and only very occasionally during the day; in June 1974 they were particularly numerous and on one night I was able to pinpoint at least 10 calling round the camp. It was possible to approach within 1–2 metres of birds calling in dense ground cover, to see the vegetation disturbed as the birds moved, and yet still not be able to see them. Calling, apparently from individual birds, continued for hours, a drawn out mournful "wooooooo" lasting for 3 seconds at intervals of 6–7 seconds. At very close range presumed contact calls were heard between birds, sometimes literally at one's feet, a soft and short "moo" (occasionally a quick "moo-moo-moo") (from the male?), answered by an equally soft but rather longer and often quavering "mair" (from the female?).

The Bulcha habitat was forest edge and open canopy forest with dense ground cover along a riverside.

In conclusion, of the 3 *Sarothrura* crakes known from Ethiopia, all have been considered rare and local. New records for *S. elegans* and *S. rufa* indicate they are more widespread than was previously thought, but *S. ayresi* has not been seen for nearly 30 years in spite of many searches in previously favoured localities.

Acknowledgements: I wish to thank Dr. George E. Watson, and Stuart Keith for reading the drafts of this paper and the latter also for details of his observations in Kaffa. Part of my observations were made whilst I was engaged in research supported in part by the Bureau of Medicine and Surgery and the Office of Naval Research under Contract No. N00014–67–A–0399–0009.

Appendix: Gazetteer of localities mentioned in the text.

Agaro, 7° 50′ N, 36° 38′ E; Belleta Forest, 7° 32′ N, 36° 33′ E; Bulcha, 6° 27′ N, 38° 11′ E; Challa, 7° 46′ N, 36° 22′ E; Didessa, 9° 02′ N, 36° 09′ E; Didessa (6 km W), 9° 04′ N, 36° 05′ E; Entotto, 9° 05′ N, 38° 45′ E; Gefersa, 9° 03′ N, 38° 40′ E; Gimbi (3 km E),

9° 12′ N, 35° 50′ E; Jimma airport, 7° 34′ N, 36° 48′ E; Koffole, 7° 05′ N, 38° 45′ E; Mega, 4° 05′ N, 38° 19′ E; Sululta, 9° 11′ N, 38° 45′ E.

Postcript: Whilst the paper on *Sarothrura ayresi* was in press, Mr. A. D. Forbes-Watson drew my attention to a 1976 paper by S. W. Wolff & P. le S. Milstein (Bokmakierie 28: 33-36), describing the re-discovery of *Sarothrura ayresi* in South Africa.

References:
Bannerman, D. A. 1911. Description of a new Rail, *Ortygops macmillani* sp. n. *Bull. Brit. Orn. Cl.* 29: 38.
Benson, C. W. 1947. Notes on the birds of southern Abyssinia. *Ibis* 89: 29–50.
Desfayes, M. 1975. Birds from Ethiopia. *Revue de Zoologie Africaine* 89: 505–535.
Erard, C. 1974. Notes faunistiques et systématiques sur quelques oiseaux d'Ethiopia *Bonn Zool. Beitr.* 25: 76–86.
Gajdacs, M. & Keve, A. 1968. Beiträge zur Vogelfauna des mittleren Athiopien. *Stuttgarter Beitr. zur Naturk.* 182: 13 pp.
Guichard, K. M. 1948. Notes on *Sarothrura ayresi* and three birds new to Abyssinia. *Bull. Brit. Orn. Cl.* 68: 102–104.
— 1950 A summary of the birds of the Addis Ababa region, Ethiopia. *Journ. East African Nat. Hist. Soc.* 19: 154–178.
Keith, G. S., Benson, C. W. & Stuart Irwin, M. P. 1970. The genus *Sarothrura* (Aves, Rallidae). *Bull. Amer. Mus. Nat. Hist.* 143 (1).
Ripley, S. Dillon. 1977. *Rails of the World.* Godine: Boston.
Roux, F. & Benson, C. W. 1969. The Buff-spotted Flufftail *Sarothrura elegans* in Ethiopia. *Bull. Brit. Orn. Cl.* 89: 119–120.
Sclater, W. T. 1930. *Systema Avium Aethiopicarum.* Taylor and Francis: London.
Urban, E. K. & Brown, L. H. 1971. *A Checklist of the Birds of Ethiopia.* Haile Selassie I. University Press: Addis Ababa.

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A Basra Reed Warbler *Acrocephalus arundinaceus griseldis* in Mozambique

by J. S. Ash

Received 20 September 1977

The Basra Reed Warbler *Acrocephalus arundinaceus griseldis* does not seem to have been recorded from Mozambique. It is therefore noteworthy that a migrant (wing 77 mm, weight 12·0 g at 0700) ringed with a British Trust for Ornithology ring (JS 33684) on 19 September 1975 at Koka (08° 27′ N, 39° 06′ E), Shoa Province, Ethiopia, was found dead at Chire (16° 42′ S, 35° 20′ E), Morrumbala District (Zambézia), Mozambique. The ring was reported on 1 February 1977, but the actual date of its recovery is not known.

The Basra Reed Warbler is such a distinctive race that some authorities have accorded it full specific status (Ticehurst 1922, Sclater 1930, Voous 1960, Mackworth-Praed & Grant 1960, Pearson & Backhurst 1976), whilst others regard it as a race of *A. arundinaceus* (Stresemann & Arnold 1949, Vaurie 1959, White 1960, Williamson 1968). I am inclined to agree with the former, but a final decision must rest on detailed field studies with particular emphasis on its song patterns.

Its winter quarters are stated by Moreau (1971) as "from Kenya to Malawi", by Vaurie (1959) as "East Africa from Kenya south to Nyasaland",

by Sclater (1930) as "south to Teita District of south Kenya Colony and to Tanganyika (Kilosa District at Nguru)", and by Mackworth-Praed & Grant (1960) as "in Kenya Colony and Tanganyika; at least one record from Nyasaland"; and White (1970) says "winters or passage from Eritrea to Kenya and once to Nyasaland". It is not known to overwinter in Ethiopia, where I have found it widespread and common as a passage migrant in autumn, between 28 August and 12 December, mostly 12–27 September, always associated with water, in lakeside or riverside vegetation either dense weeds, acacia bush, tamarisk woodland or low thick bushes (Ash in press). There are no spring records. In Kenya it is a common autumn passage migrant (Pearson & Backhurst 1976), but is unknown in Somalia (Archer & Godman 1961), where it must surely occur. In southern Somalia there is one specimen from Kisimao (Van Someren 1929). There are no records from Zambia (Benson *et al.* 1973).

The present remarkable record from Mozambique extends the winter range of this race for at least 280 km south of the most southerly record I can trace, namely a single bird on 22 March 1943 at Fort Johnston in Malawi (Benson 1953), which itself was over 980 km south of the most southerly occurrences in Tanzania. The evidence suggests that all previous Basra Reed Warblers were on passage in the areas where they have been recorded in East Africa, except for the one in Malawi. Their late winter quarters are still unknown, and it is possible that the birds in Mozambique and Malawi provide a clue to where these may be.

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References:

Archer, G. & Godman, E. M. 1961. *The Birds of British Somalia and the Gulf of Aden.* Vol. IV. Oliver and Boyd: Edinburgh and London.
Ash, J. S. (in Press). Migrational status of Palaearctic birds in Ethiopia. *Ostrich.*
Benson, C. W. 1953. *A Checklist of the Birds of Nyasaland.* Blantyre and Lusaka: Nyasaland Society.
— Brooke, R. K., Dowsett, R. J. & Irwin, M. P. S. 1973. *The Birds of Zambia.* Collins: London.
Mackworth-Praed, C. W. & Grant, C. H. B. 1960. *Birds of Eastern and North-Eastern Africa.* Longmans: London.
Moreau, R. E. 1971. *The Palaearctic African Bird Migration Systems.* Academic Press. London.
Pearson, D. J. & Backhurst, G. C. 1976. The southward migration of Palaearctic birds over Ngulia, Kenya. *Ibis* 118: 78–105.
Sclater, W. L. 1930. *Systema Avium Aethiopicarum.* Taylor and Francis: London.
Stresemann, E. & Arnold, J. 1949. Speciation in the group of Great Reed Warblers. *Journ. Bombay Nat. Hist. Soc.* 48: 428–443.
Ticehurst, C. B. 1922. Remarks on Reed Warblers from Mesopotamia. *Bull. Brit. Orn. Cl.* 43: 46.
Van Someren, V. G. L. 1929. Notes on the birds of Jubaland and the northern frontier. J. East Afr. and Uganda Nat. Hist. Soc. 35: 25–70.
Vaurie, C. 1959. *The Birds of the Palearctic Fauna.* Witherby: London.
Voous, K. H. 1960. *Atlas of European Birds.* Nelson: London.
White, C. M. N. 1960. A check list of the Ethiopian Muscicapidae (Sylviinae). Part 1. *Occ. Papers Nat. Mus. S. Rhodesia,* No. 24 B: 399–430.

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Bulletin of Zoological Nomenclature: Opinions

In continuation of *Bull. Brit. Orn. Cl.* 97, 1977: 104, and by permission of the International Trust for Zoological Nomenclature, the following Rulings are quoted as extracts from Opinions published in *Bull. Zool. Nomencl.* affecting birds:

OPINION 1078

(*Bull. Zool. Nomencl.* 34(1), 1977: 14)

Anas punctata Burchell, 1822 (Aves): suppressed under the plenary powers.

(1) Under the plenary powers the specific name *punctata* Burchell, 1822, as published in the binomen *Anas punctata*, is hereby suppressed for the purposes of the Law of Priority but not for those of the Law of Homonymy.

(2) The following specific names are hereby placed on the Official List of Specific Names in Zoology with the Name Numbers indicated:

(a) *hottentota* Eyton, 1838, as published in the binomen *Querquedula hottentota* (Name Number 2600);

(b) *maccoa* Eyton, 1838, as published in the binomen *Erismatura maccoa* (Name Number 2601).

(3) The specific name *punctata* Burchell, 1822, as published in the binomen *Anas punctata*, and as suppressed under the plenary powers, in (1) above, is hereby placed on the Official Index of Rejected and Invalid Specific Names in Zoology with the Name Number 1018.

OPINION 1081

(*Bull. Zool. Nomencl.* 34(1), 1977: 25)

Addition of Family-Group Names based on *Alca* (Aves) and *Alces* (Mammalia) to the Official List of Family-Group Names in Zoology.

(1) The following names are hereby added to the Official List of Family-Group Names in Zoology with the Name Numbers specified:

(a) Alcidae (ex Alcadae) Anon., 1820, type-genus *Alca* Linnaeus, 1758 (Class Aves) (Name Number 486);

(b) Alceidae (ex Alcedae) Brookes, 1828, type-genus *Alces* Gray, 1821 (Class Mammalia) (Name Number 487).

IN BRIEF

Sea and coastal birds collected in Angola by H. Skoog in 1912

Brinck (1955, *South African Animal Life*, vol. II, cap. XVII) gives data on Phthiraptera obtained from birds specially collected for their ectoparasites by H. Skoog in 1912 at Porto Alexandre (15° 49′ S, 11° 53′ E) on the Mossamedes coast of Angola. Most of the birds were Palaearctic migrants or seabirds and since the records are accurately dated it seems worthwhile making them more readily available.

Species	*Date*	*Locality*
Diomedea chlororhynchos	24.vii & 16.viii.12	off Porto Alexandre
Phalacrocorax carbo	28.viii.12	Porto Alexandre
Phoenicopterus ruber (2 specimens)	24.vii.12	”
P. minor (3 specimens)	10.x.12	”
Charadrius pallidus	3.viii. & 23.x.12	”
C. marginatus	8.vii.12	”
Pluvialis squatarola	20.xi.12	”

Species	*Date*	*Locality*
Philomachus pugnax	13.x.12	Rio Curoca, Porto Alexandre
Calidris ferruginea	20.x.12	Porto Alexandre
C. minuta	23.x.12	”
C. alba (6 specimens)	23.x.12	”
Recurvirostra avosetta	23.ix.12	”
Stercorarius parasiticus	23.x.12	”
Larus cirrocephalus	23.x.12	”
Sterna sandvicensis (4 specimens)	2.xi.12	”
S. hirundo	30.x.12	”
S. balaenarum	20.xi.12	”
Corvus albus (2 specimens)	12.vii.12	”

The general occurrence and distribution of Angolan birds is covered by Traylor (1963, Check-list of Angolan Birds, *Publ. Cult. Comp. Diam. Ang.* 61). Most of the above records do not require a modification of Traylor's appreciation but a few require comment. *Diomedea chlororhynchos* was only included by Traylor on visual evidence. The record of *Charadrius pallidus* provides a second Angolan locality. That of *C. marginatus* extends the coastal distribution far to the south. The record of *Sterna balaenarum* is the second for Angola. Records of the last 2 species have since been supplemented by further collecting of *C. marginatus* on 20 and 23 May 1966 at the Curoca River and of *S. balaenarum* to the south at Baia dos Tigres on 15 November 1968 and of both species at the Cunene estuary (Pinto (1973), Aditamento a avifauna do Distrito de Mocamedes, Angola, in *Livro de Homenagem ao Professor Fernando Frade Viegas da Costa 70° Aniversario—27 de Abril de* 1968, Lisbon).

16 November 1977 R. K. Brooke

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Miscaptions on Plates of weavers in works by Mackworth-Praed & Grant

Arising from correspondence with Stewart Lane, of Blantyre, Malawi, it has come to light that, while the adult plumages of the Brown-capped Weaver *Ploceus* (*Phormoplectes*) *insignis* and Bertram's Weaver *P.* (*Xanthoploceus*) *bertrandi* are correctly described by Mackworth-Praed & Grant (1963, *Birds of the Southern Third of Africa*, Vol. 2: 585–586), on Plate 67 the captions for these 2 species have been transposed. Furthermore, while the same authors (1973, *Birds of West Central and Western Africa*, Vol. 2: 641) again give a correct description for *P. insignis*, Plate 80 shows *P. bertrandi* miscaptioned as *insignis*. *P. bertrandi* is unknown from anywhere in the area covered in this latter work, and correctly there is no mention of it in the text.

3 January 1978 C. W. Benson

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Dr. J. F. MONK

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FORTHCOMING MEETINGS

Monday 17 July 1978 at 6.30 p.m. for 7 p.m. at the Goat Tavern, 3 Stafford Street, London, W.1. (nearest Underground station—Green Park). Mr. M. W. Woodcock on *The birds of Oman*. Those wishing to attend must send a cheque for £2.65 per person to R. E. F. Peal, 24 Creighton Avenue, London, N.10, with their acceptance on the enclosed slip to arrive not later than the first post on Thursday 13 July.

Tuesday 19 September 1978 at 6.30 p.m. for 7 p.m. in the Senior Common Room, South Side, Imperial College (entrance on the south side of Prince's Gardens, S.W.7, off Exhibition Road). Sir Hugh Elliott, Bt., O.B.E., President of the B.O.U., on *Some problems of the heron family*. Those wishing to attend must send a cheque for £3.90 per person with their acceptance on the enclosed slip to Mrs. Diana Bradley, 53 Osterley Road, Isleworth, Middlesex, to arrive not later than first post on Thursday 14 September 1978.

Tuesday 21 November 1978, jointly with the B.O.U. at Imperial College, Mr. E. M. Nicholson, C.B. on *The role of British Ornithologists in Europe* and Mr. P. J. Conder, O.B.E. on *British Ornithologists in the Indian sub-continent*.

Tuesday 9 January 1979, Mr. J. H. R. Boswall on *Mutual mimics, men as birds and birds as men—an ornithological frolic*.

Bulletin of the BRITISH ORNITHOLOGISTS' CLUB

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The seven hundred and eleventh Meeting of the Club was held at the Goat Tavern, 3 Stafford Street, London, W.1. on Tuesday 14 March, 1978 at 7 p.m.

Chairman: Mr. Peter Hogg; present 16 members and 7 guests. Dr. Bruce Campbell, O.B.E., spoke on *Problems of gravel pits.* He illustrated his address with pictures and described the adaption of several species of birds to breeding in artificial habitats.

The seven hundred and twelfth Meeting of the Club was held in the Senior Common Room, South Side, Imperial College, London, S.W.7. on Wednesday 31 May at 7 p.m.

Chairman: Mr. Peter Hogg: present 27 members and 16 guests.

Dr. John Warham of the Zoology Department, University of Canterbury, Christchurch, N.Z. reported on the re-discovery of the Taiko on the Chatham Islands on 1 January 1978 by David Crockett. Mr. Crockett has been trying to locate this species, probably *Pterodroma magentae*, for a number of years, mounting expeditions to the main island of the Chathams. At last he has caught, photographed and measured two specimens and seen two more. He plans to mount a larger expedition in 1978/79 in the hope of locating nesting burrows. It will then be necessary to attempt to protect the remnant population from pigs, cats and rats, in the hope that the species may survive. This seems likely to need the erection of a pig-proof fence, which may well prove very expensive.

The principal speaker, Professor S. Dillon Ripley, then addressed the Club on *New possibilities in the management of endangered species.*

It used to be thought that preservation of habitat would be sufficient to stop rare species of birds from becoming extinct but it had become apparent that it was necessary to study the biology and ecology of species and then, in many cases, to practice techniques often requiring very great skill to enable them to breed with sufficient success for the species to be perpetuated.

Details were given of some of the techniques being carried out with endangered species of crane, for example the Whooping Crane *Grus americana*, Siberian Crane *Grus leucogeranus* and the Japanese Crane *Grus japonensis*. Birds suffering from infirmity or old age were helped to come into breeding condition by courtship displays imitated by workers, artificial insemination was performed, and in areas formerly occupied by the endangered species, eggs or young were transferred to the nests of sibling species in which courtship displays were sufficiently different for the danger of subsequent hybridization to be small.

The Puerto Rican Parrot *Amazona vittata*, down to 16 birds in 1971 but now with 29 birds in the wild and 10–12 in captivity, was an excellent example of the combination of environmental conservation with biological investigation. The forests of the Luquillo mountains were its only remaining habitat and they were conserved by a government agency. However the parrots' numbers continued to fall ever nearer to extinction, due primarily to a shortage of nest sites, which had not been suspected; there were also other difficulties, including competition from the Pearly-eyed Thrasher *Margarops fuscatus*, which first came there about 1950.

The excellent colour film with sound track *The Parrots of Luquillo* was shown by Professor Ripley in conclusion and illustrated many of the points brought out by him.

ANNUAL GENERAL MEETING

The eighty-sixth Annual General Meeting of the British Ornithologists' Club was held at Imperial College, London, S.W.7. on Wednesday 31 May 1978 at 6 p.m. with Mr. P. Hogg in the chair. Fourteen members were present.

The Report of the Committee and Accounts for 1977 were presented and the Hon. Treasurer explained that the excess of expenditure over income of £56. was not unsatisfactory, as it was less than the non-recurring expenditure on printing and postages for the promotion of *Bulletin* sales. On the Chairman's proposal they were received and adopted unanimously. The Editor stated that the material being submitted for the *Bulletin* was most

INCOME AND EXPENDITURE ACCOUNT for the year ended 31st DECEMBER, 1977

1976 £	EXPENDITURE	£·p	£·p
	Cost of Publication and Distribution of *Bulletin*	2,320·65	
2,070	Cost of Re-Prints	231·25	2,551·90
60	Notices, etc. for Meetings and Recruitment Leaflets		74·59
32	Audit Fee—1977		32·40
29	Lecture and Dinner Expenses		14·87
90	Miscellaneous Expenditure and Postage		192·47
10	Projector Depreciation		10·00
234	Transfer to General Fund (1976)		—
£2,525			£2,876·23

1976 £	1976 £	INCOME	£·p	£·p
		SUBSCRIPTIONS:		
	1,018	Members and Associates	981·81	
1,665	647	Subscribers	688·02	1,669·83
184		Sales of *Bulletins* for previous year		466·35
		INCOME TAX RECOVERED UNDER DEEDS OF COVENANT, ETC:—		
		Covenants	116·10	
203		Other	34·85	150·95
		INVESTMENT AND DEPOSIT INCOME:		
		General Fund	81·36	
154		Trust Fund	48·98	130·34
		RENT—*Less* EXPENSES:		
265		Property, "Clovelly", Tring		339·00
54		Donations		63·72
—		TRANSFER TO GENERAL FUND, BEING EXCESS OF EXPENDITURE OVER INCOME		56·04
£2,525				£2,876·23

BALANCE SHEET as at 31st DECEMBER, 1977

1976 £		£·p	£·p
	GENERAL FUND		
	As at 31st December, 1976	1,792·30	
	Deduct: Transfer from Income and Expenditure Account	56·04	1,736·26
1,793			
	BULLETIN FUND		
110	Donations from Members		110·15
42	CREDITORS		550·27
1,945			2,396·68
	TRUST FUND (The capital of this Fund may not be used—the income from it is General Revenue)		
1,000	F. J. F. Barrington Legacy		1,000·00
£2,945			£3,396·68

P. HOGG, *Chairman*

M. ST. J. SUGG, *Hon. Treasurer*

1976 £		£·p	£·p	£·p
	GENERAL FUND INVESTMENTS			
	£100 8½% Treasury Loan	100·00		
80	*Less:* Reserve	20·00	80·00	
	(£83) Market Value £99·00			
	Salisbury District Council Bond (10%)	1,000·00		
1,000	Encashed	1,000·00	—	
—	Thurrock Borough Council Bond (10%)		1,000·00	1,080·00
	PROJECTOR AND SCREEN			
	At Cost		100·00	
40	*Less:* Depreciation		70·00	30·00
	STOCK OF *Bulletin*—Nominal Value			
	No value has been included for the			
1	stock of the Scientific Index			1·00
—	DEBTORS			—
	CASH AT BANK—Current Account		827·94	
824	—Deposit Account		457·74	1,285·68
1,945				2,396·68
	TRUST FUND INVESTMENT			
1,000	£1,399·55 3½% War Stock			1,000·00
	(£363·88) Market Value £517·91			
£2,945				£3,396·68

I have prepared the above Balance Sheet and annexed Income and Expenditure Account from the books and records of the Club and certify them to be in accordance therewith.

72 HENDFORD, YEOVIL, SOMERSET *9th February, 1978*

K. P. GEE, *Registered Accountant.*

satisfactory, but that its quantity, together with the financially limited number of pages which could be printed in the *Bulletin*, was leading to a pre-publication waiting time for submitted typescripts of over 9 months.

There being no nominations additional to those of the Committee, the following were declared elected:—

Hon. Treasurer: Mrs. D. M. Bradley (*vice* Mr. M. St.J. Sugg, who retired on completion of his term of office).

Hon. Secretary: Mr. R. E. F. Peal (re-elected).

Committee: Mr. P. J. Oliver (*vice* Mrs. D. M. Bradley, who retired by rotation).

The Chairman thanked Mr. Sugg warmly for his services to the Club as Hon. Treasurer for the last four years. The Club was greatly indebted to him for the efficiency with which he had dealt with the considerable amount of work involved, especially as it had not been easy for him to attend meetings due to living at a distance from London.

The Meeting closed at 6.15 p.m.

Evidence for the removal of *Pseudopodoces humilis* from the Corvidae

by Stephen R. Borecky

Received 8 November 1977

Pseudopodoces is a monotypic genus of the family Corvidae endemic to the arid regions of central Asia. Hume (1871: 408) examined several specimens of birds collected by Henderson on the Yarkand expedition, and, on the basis of the external morphology and distribution of two of these, named two new species of the genus *Podoces* (*P. humilis* and *P. hendersoni*). It is difficult to understand why Hume would consider these birds to be members of the same genus, since his descriptions of their size and colouration do not substantiate his conclusions. Zarudny & Loudon (1902: 185) divided *Podoces* into three subgenera, placing *Podoces humilis* as the sole species of their new subgenus *Pseudopodoces*. They based this on the observation that *Pseudopodoces* lacks the black plumage of the head and nape and the white wing bars characteristic of the other members of the genus. Hartert (1903: 40) recognized that *Podoces humilis* stood apart from other members of the genus, but did not believe it to be generically separable, and despite the description of *Pseudopodoces* by Zarudny & Loudon (1902), he still maintained that *Pseudopodoces* should not be separated on the basis of colour characters (Hartert 1932: 30). Hartert stated that he could find no important structural differences, although he mentioned that *Pseudopodoces* has a shorter tail, bill and outer primary in comparison to *Podoces*.

Although Stresemann (1928: 82) used the generic name *Pseudopodoces* in describing the subspecies *P. h. saxicola*, he did so without explanation. The earliest discussion I have seen of the validity of *Pseudopodoces* as a genus is that of Riley (1930: 20). In addition to the plumage characters invoked by Zarudny & Loudon, and the short tail, bill, and outer primary observed by Hartert, Riley mentioned the obsolescent scutation of the acrotarsium of *Pseudopodoces* as a characteristic differentiating it from *Podoces*.

Thomson (1964: 167) mentioned that *Pseudopodoces* 'looks more like one of the larks (Alaudidae) than a crow'. I do not interpret this statement as indicating phylogenetic relationships, but merely as an example of the size of this small 'corvid'. The genus 'departs from the family [Corvidae] norm

by nesting in crevices in walls or in rodent holes, and in having white eggs' (Thomson 1964: 167). *Podoces* nests in bushes and has spotted eggs. Goodwin (1976: 339) adds that *Pseudopodoces* may also nest in its own excavations in earth banks, another non-corvid characteristic.

I have recently completed a study of the appendicular myology and phylogenetic relationships of the avian 'corvid assemblage' (Borecky 1977) that included specimens of *Podoces hendersoni* and *Pseudopodoces humilis*. After examining 25 specimens representing 24 of the 26 genera of the Corvidae, I found that all members of the family, with the exception of *Pseudopodoces*, were characterized by the same combination of both primitive and derived myological features. The primary derived character, the presence of a femoral head of origin of M. flexor digitorum longus, was absent in *Pseudopodoces*. However, *Pseudopodoces* possesses several derived states that are not characteristic of corvids. These are:—the dorsal belly of M. obturatorius lateralis is absent; the tendon of insertion of M. flexor perforans et perforatus digiti II does not ensheath the tendon of M. flexor digitorum longus nor bifurcate; and there are two pneumatic fossae in the humerus.

On the basis of these anatomical differences as well as the atypical nesting behaviour and egg colouration of *Pseudopodoces*, I suggest that *Pseudopodoces* should not be considered a member of the Corvidae. The question that remains is that of the true affinities of this bird. In my study of the 'corvid assemblage' I also examined representatives of 20 genera of the Sturnidae. The behaviour, distribution, and myology of *Pseudopodoces* is similar to that of the sturnids. However, in *Pseudopodoces* the M. pectoralis pars propatagialis longus is tendinous, while it is fleshy (a derived characteristic) in all of the sturnids examined. Based on this observation, I am hesitant to conclude that *Pseudopodoces* is closely allied to the Sturnidae. However, I suggest that this possibility should not be ruled out until a comprehensive study of the external morphology, osteology, pterylosis, and behaviour of this bird is conducted.

Acknowledgements: I wish to thank Dr. Philip Burton of the British Museum (Natural History) for supplying the specimens upon which this study was based. I also wish to thank Dr. Kenneth Parkes of Carnegie Museum of Natural History and Dr. Robert Raikow of the University of Pittsburgh for reading and criticizing the manuscript.

References:

Borecky, S. R. 1977. The appendicular myology and phylogenetic relationships of the avian 'corvid assemblage'. Ph.D. diss., Univ. of Pittsburgh.

Goodwin, D. 1976. *Crows of the World*. Ithaca, New York, Cornell University Press.

Hartert, E. 1903. *Die Vogel der paläarktischen Fauna*. Heft I. Berlin, R. Friedländer & Sohn.

— 1932. *Die Vogel der paläarktischen Fauna*. Erganzungsband, Heft I. Berlin, R. Friedländer & Sohn.

Hume, A. 1871. Stray notes on ornithology in India. *Ibis*: 403–413.

Riley, J. H. 1930. Birds collected in Inner Mongolia, Kansu, and Chihli by the National Geographic Society's Central-China expedition under the direction of F. R. Wulsin. *Proc. U.S. Nat. Mus.* 77: 1–39.

Stresemann, E. 1928. *Pseudopodoces humilis saxicola* subsp. nova. *Orn. Monatsb.* 36: 82–83.

Thomson, A. L. 1964. *A New Dictionary of Birds*. London.

Zarudny, N. & Loudon, H. 1902. Uber Einteilung des genus *Podoces* in subgenera. *Orn. Monatsb.* 10: 185.

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Piroplasmosis in the masked booby *Sula dactylatra melanops* in the Amirantes, Indian Ocean

by M. A. Peirce & C. J. Feare

Received 11 January 1978

The few studies on the haematozoa of birds from islands in the Indian Ocean have been largely concerned with land birds (Bennett & Blancou 1974, Peirce & Cheke 1977, Peirce *et al.* 1977), although Lowery (1971) also examined some sea birds (*Fregata minor*, *F. ariel*, *Anous stolidus*) on Aldabra.

During a visit to some of the Seychelles, Amirantes and Farquhar islands in Oct.–Nov. 1976 C. J. F. collected blood samples and ticks from seabird colonies for further studies on arboviruses (Converse *et al.* 1975, 1976, Hoogstraal *et al.* 1976) which had been implicated in the desertion of eggs and chicks by Sooty Terns *Sterna fuscata* (Feare 1976). Whenever practicable, their blood smears were also collected, using techniques described by Peirce *et al.* (1977), for parasitological examination. The Sooty Tern breeding season was over, but in Masked Booby *Sula dactylatra melanops* colonies all stages of the breeding cycle were present.

Only 2 out of 34 birds examined (Table 1) were found to harbour haematozoa. Both were nestling Masked Boobies from Desnoeufs, Amirantes, and they showed very low parasitaemias with an hitherto unrecorded avian piroplasm. The morphology of the intra-erythrocytic parasites was typical of *Babesia* spp., which are tick borne, and they exhibited 'Maltese-cross' dividing forms which appear to be characteristic of species from avian hosts (Peirce 1975). Unfortunately, an insufficient number of parasites was present to permit a detailed description of what is almost certainly a new species; no such parasite has been previously reported from seabirds (Peirce 1975).

Two species of tick are found in Indian Ocean seabird colonies, the argasid *Ornithodoros capensis* and the ixodid *Amblyomma loculosum*. Argasid ticks are rarely incriminated as piroplasm vectors, so the more likely vector of this tick-transmitted parasite is *A. loculosum*. The discovery of these parasites in booby chicks suggests that transmission from tick to avian host occurs at the nest during the breeding season. *A. loculosum* is reported to be a rapid feeder, taking only a few days to complete engorgement (H. Hoogstraal pers. comm.) and it is therefore unlikely that many ticks are carried by the birds when they disperse from breeding colonies.

As transmission of *Babesia* spp. is usually via the transovarial route from infected female ticks and then by trans-stadial passage through larvae and nymphs to adults, there is probably a permanent reservoir of infected *A. loculosum* in and around nesting colonies. However, only 6 specimens of *A. loculosum* have been recorded from Desnoeufs, all of them in June (Hoogstraal *et al.* 1976). None was found in October 1976 when the blood smears were taken; nor were any found in the large (*c.* 3000 pairs) Masked Booby colony on Bordeuse. This apparently low density of *A. loculosum* is comparable with that on Bird Island, Seychelles, but contrasts with the heavy infestations recorded on African Banks, Amirantes, in June 1974 (Hoogstraal *et al.* 1976) and on Goelette Island, Farquhar Atoll (Stoddart & Poore 1970; Feare pers. obs. in October 1976). No blood smears have been taken from

seabirds on African Banks, but on Goelette Island no piroplasms were found in the blood of fledged but weak Sooty Tern chicks (Table 1), despite their high infestation with larvae, nymphs and adults of *A. loculosum*.

TABLE 1

Western Indian Ocean seabirds examined for blood parasites

Bird species		*No. examined /No. infected*	*Location and date*
Brown Noddy *Anous stolidus pileatus*	Adult	1/0	Bird Island. 55° 12′ E, 3° 53′ S. 7.x.76.
Sooty Tern *Sterna fuscata nubilosa*	Chicks	3/0	Bird Island. 55° 12′ E, 3° 53′ S. 7.x.76.
Sooty Tern *Sterna fuscata nubilosa*	Chicks	4/0	Goelette Island, Farquhar Atoll. 51° 08′ E, 10° 13′ S. 24.x.76.
Sooty Tern *Sterna fuscata nubilosa*	Chicks	17/0	Desnoeufs. 53° 1′ E, 6° 13′ S. 15/16.x.76.
Masked Booby *Sula dactylatra melanops*	Chicks	9/2	Desnoeufs. 53° 1′ E, 6° 13′ S. 15/16.x.76.

The absence of other haematozoa from the blood smears collected is inconclusive owing to the small sample of birds examined, but it is notable that Lowery (1971) found that on Aldabra 7% of seabirds examined were infected with haemoproteids.

The foregoing observations point to a need for further work on the piroplasms and tick vectors and their seasonal dynamics in relation to the varied avian reproductive cycles and tick abundances found in the different seabird colonies.

Acknowledgements: C. J. F. thanks the National Geographic Society for a research grant which enabled him to visit the seabird colonies, and we are grateful to Dr. Harry Hoogstraal for his constant stimulation and advice.

References:

Bennett, G. F. & Blancou, J. 1974. A note on the blood parasites of some birds from the Republic of Madagascar. *J. Wildl. Dis.* 10: 239–240.

Converse, J. D., Hoogstraal, H., Moussa, M. I., Feare, C. J. & Kaiser, M. N. 1975. Solado virus from *Ornithodoros* (*Alectorobius*) *capensis* (Ixodoidea: Argasidae) infesting Sooty Tern colonies in the Seychelles, Indian Ocean. *Am. J. Trop. Med. Hyg.* 24: 1010–1018.

Converse, J. D., Hoogstraal, H., Moussa, M. I., Kaiser, M. N., Casals, J. & Feare, C. J. 1976. Aride virus, a new ungrouped arbovirus invecting *Amblyomma loculosum* ticks from Roseate Terns in the Seychelles. *Arch. Virol.* 50: 237–240.

Feare, C. J. 1976. Desertion and abnormal development in a colony of Sooty Terns infested by virus-infected ticks. *Ibis* 118: 112–115.

Hoogstraal, H., Wassef, H. Y., Converse, J. D., Keirans, J. E., Clifford, C. M. & Feare, C. J. 1976. *Amblyomma loculosum* (Ixodoidea: Ixodidae): Identity, marine bird and human hosts, virus infection, and distribution in the southern oceans. *Ann. Ent. Soc. Am.* 69: 3–14.

Lowery, R. S. 1971. Blood parasites of vertebrates on Aldabra. *Phil. Trans. Roy. Soc. Lond.* B.260: 577–580.

Peirce, M. A. 1975. *Nuttallia* Franca, 1909 (Babesiidae) preoccupied by *Nuttallia* Dall, 1898 (Psammobiidae): A re-appraisal of the taxonomic position of the avian piroplasms. *Int. J. Parasit.* 5: 285–287.

Peirce, M. A. & Cheke, A. S. 1977. Some blood parasites of birds from the Comoro Islands. *J. Protozool.* 24: Suppl. 33A.

Peirce, M. A., Cheke, A. S. & Cheke, R. A. 1977. A survey of blood parasites of birds in the Mascarene Islands, Indian Ocean, with descriptions of two new species and taxonomic discussion. *Ibis* 119: 451–461.
Stoddart, D. R. & Poore, M. E. D. 1970. Geography and ecology of Farquhar Atoll. *Atoll Res. Bull.* 136: 7–26.

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An oviduct egg of the Indian Cuckoo *Cuculus micropterus*

by J. F. R. Colebrook-Robjent

Received 10 January 1978

Medway & Wells (1976) give 2 breeding records for *Cuculus micropterus* in the Malay Peninsula, both involving juvenile specimens, taken in July and September respectively. They could find no records of eggs or nestlings and state that the hosts of this cuckoo are unknown in Malaya.

On 29 April 1964 I shot a ♀ of the resident race *C. m. concretus* as it flew over a path in primary forest at canopy height just before dusk, north of Kota Tinggi in the state of Johore (*c.* 1° 50′ N, 103° 55′ E), altitude under 150m a.s.l. The oviduct contained a fully formed and pigmented egg, unfortunately broken by the shot. However, I noted that the shape appeared to be blunt on the broad pole and the colour of the yolk (surprisingly for a cuckoo) I recorded as 'deep orange'. The colour of the egg is very pale pinkish-grey, over which small spots of dark liver-brown (largest spots about 1 mm) are scattered rather regularly. Underlying these are less numerous and smaller spots of grey, all somewhat more concentrated around the broadest part of the egg. The egg has been repaired and now measures approximately 20 × 15 mm, certainly substantially less than its original size. It is not unlike some eggs laid by *Dicrurus* species.

The female has wing length 165 mm, tail 144 mm and anterior margin of nostril to bill tip 17 mm. It may not be in definitive adult plumage as the breast is rufous-buff and barred dark brown, and the tail is in irregular moult, the left and right outer rectrices being respectively 45 and 34 mm shorter than the central pair. The third and fourth right rectrices are 6 mm shorter than the second. Rufous notches are present on the webs of the central rectrices, evidently also indicating subadult plumage (Medway & Wells). The iris is brown, the gape, eyelids and feet yellow, as also is the hind claw, the other claws being horn-brown. The upper mandible and the cutting edge of the lower mandible are horn, the remainder of the bill grey. The stomach was packed with green and other caterpillars.

Acknowledgement: I am grateful to Dr. D. R. Wells for commenting upon an early draft of this note.

References:

Medway, Lord & Wells, D. R. 1976. *The Birds of the Malay Peninsula* Vol. V. *Conclusions and survey of every species*. London: H. F. & G. Witherby.

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Convergence between *Terpsiphone corvina*, *T. atrochalybea* and *Piezorhynchus alecto*

by P. W. Greig-Smith

Received 16 November 1977

During studies of endemic landbirds in the Seychelles islands, Indian Ocean, in Sept and Oct 1976, I was impressed by the close resemblance in plumage of the Seychelles Paradise Flycatcher *Terpsiphone corvina* to a species which I observed in Papua New Guinea in 1973, the Shining Monarch Flycatcher *Piezorhynchus alecto*. A third species, the São Tomé Paradise Flycatcher *Terpsiphone atrochalybea*, is also very similar. This paper describes the extent of the similarities, and discusses whether they can be attributed to similar selection pressures. Several *P. alecto* of both sexes, and one male *T. corvina* were mist-netted and examined in the field, and subsequently skins of all three species were examined in the British Museum (Natural History).

T. corvina now exists as a single population on La Digue, though previously occurring also on other islands (see Benson 1971). The species is illustrated by Newton (1867) and Penny (1974). The adult male is entirely glossy blue black, with a pale blue fleshy eye-ring extending in a line to the corner of the gape. The bill is blue, and the gape vivid yellow-orange. As in most Paradise Flycatchers, the central tail feathers are greatly elongated (up to 300 mm, see Benson 1971). The female's plumage is strikingly different, the upperparts being bright rufous, the underparts white, and the whole head glossy black. The tail is not elongated as in the male, and there is no line between the blue eye-ring and the bill.

P. alecto is widely distributed throughout the lowland forests of New Guinea (Rand & Gilliard 1967). I observed *P. a. chalybeocephalus* in the Sepik District, Papua New Guinea, but all subspecies have similar plumage patterns. The male is entirely glossy blue black, and has a blue bill and yellow-orange gape similar to male *T. corvina*. The only major difference is the lack of a long tail and a blue eye-ring in *P. alecto*. The female has a plumage pattern very similar to female *T. corvina*. differing only in the lesser extent of the black plumage on the head. I could not distinguish the shade of rufous on the upperparts of the two species when skins were compared.

T. atrochalybea is restricted to São Tomé in the Gulf of Guinea (Bannerman 1936). The male is entirely glossy blue black, with a long tail. The female resembles females of the other two species (*P. alecto* more closely than *T. corvina*, since the throat is white), except that the underparts are mottled with blue black. The bill and legs are blue.

Can these resemblances be due to a close systematic relationship? Keast (1958) placed *alecto* in *Piezorhynchus*, but others have referred the species to *Monarcha* (Rand & Gilliard 1967, Morony *et al.* 1975) or *Myiagra* (e.g. Diamond 1972. Storr 1977, Slater 1975). These three genera have not been considered to be particularly closely related to *Terpsiphone*, though all are in the same subfamily (Muscicapidae; Monarchinae). However, it is very likely that this is the case, and that the genus *Terpsiphone* is most closely related to the genus *Piezorhynchus* (I. C. J. Galbraith *in litt.*). At least some of the resemblances may therefore be ancestral, especially as the variation in colour and pattern of plumage in these genera is rather limited. Nevertheless, because *T. corvina* and *T. atrochalybea* are probably independent derivatives of

T. viridis of continental Africa (Hall & Moreau 1970, Benson 1971), which is much less like *P. alecto*, it is highly improbable that *P. alecto* is most closely related to either of the two island species within *Terpsiphone*, and therefore it appears that there has been convergent, or at least parallel, development of the resemblances between *Piezorhynchus* and *Terpsiphone*.

It seems appropriate to seek parallels in the ecology of the species, particularly as Holyoak & Thibault (1977) have demonstrated the adaptiveness of plumage patterns and colours in some other monarchine flycatchers. Sexual dimorphism in plumage is usually associated with a division of labour between the sexes. In *T. corvina*, the male carries out territory defence (Gaymer *et al.* 1969, Penny 1974, pers. obs.), while the female does most nest-building, incubation and feeding of nestlings, although assisted occasionally by the male (Penny 1974, Fayon 1971, Fraser 1972, pers. obs.). The scant information available for *P. alecto* suggests that the roles of the sexes are broadly similar to those in *T. corvina*, the female carrying out most nest duties (Gilliard & Lecroy 1966, Rand & Gilliard 1967, pers. obs.). If plumage patterns have evolved to be appropriate to these roles, females might be expected to have camouflage to reduce predation at the nest, while males might have more conspicuous display plumage. In the shady *Terminalia-Calophyllum* woodland in which *T. corvina* breeds on La Digue, I found males to be very conspicuous, and females, being both disruptively patterned and counter-shaded, less so. Fayon (1971) also considered females to be more difficult to detect. *P. alecto* occurs in structurally similar woodland, though also in mangroves and dense forest understory (Gilliard & Lecroy 1966, Rand & Gilliard 1967, pers. obs.), and the nest is built in low, exposed branches, as in *T. corvina* (see Rand & Gilliard 1967, Fraser 1972). I found males more conspicuous than females, though both were less obvious than *T. corvina*.

The gross patterns of plumage of these two species appear to be appropriate to the sexes' roles in nesting and territoriality. Unfortunately, even less is known of the biology of *T. atrochalybea*, and it is not possible to assess whether it shows similar ecology and behaviour, although this is possible (see Bannerman 1936, Snow 1950).

Holyoak & Thibault (1977) interpreted the plumage saturation of Polynesian *Pomarea* flycatchers as providing camouflage from their insect prey (although in some species it may also have a display function). Although the two *Terpsiphone* species and *P. alecto* are insectivorous (the former by fly-catching, the latter by gleaning), and Fayon (1971) and A. S. Cheke (pers. comm.) thought that male *T. corvina* spend more time than females in the more shaded lower parts of trees, it seems doubtful that selection pressures associated with foraging niches alone could have produced such extreme sexual dimorphism.

In both *T. corvina* and *P. alecto*, the orange-yellow gape is displayed most prominently when the bill is opened wide to utter a harsh scolding call, together with erection of the black crown feathers. This call, which may be a threat display, sounds very similar in the two species, and *T. atrochalybea* apparently has a similar call (Bannerman 1936), perhaps a reflection of their probable close systematic relationship.

Although plumage resemblance appears to be correlated with general similarities in ecology, at least for *T. corvina* and *P. alecto*, there is no obvious peculiarity of these three species which sets them aside from other monarchine

flycatchers. (However, in some species with less extreme sexual dimorphism, the sexes take a more equal role in nesting—e.g. *T. viridis* (Moreau 1949, Skead 1967).) The convergence of *T. corvina* and *T. atrochalybea* might be a consequence of competitive release and relief from predation in similar small island environments, but this can hardly be so in *P. alecto*, which exists in very species-rich communities. Perhaps there are subtle features of their habitats which make these particular plumage patterns adaptive, while a shared phylogeny and conservatism of plumage probably contribute to the resemblance.

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References:
Bannerman, D. A. 1936. *The Birds of West Tropical Africa.* Vol. 4. Crown Agents, London.
Benson, C. W. 1971. Notes on *Terpsiphone* and *Coracina* spp. in the Malagasy region. *Bull. Brit. Orn. Cl.* 91: 56–64.
Diamond, J. M. 1972. Avifauna of the Eastern Highlands of New Guinea. *Publs. Nuttall Ornithol. Club* 12. Cambridge, Mass.
Fayon, M. 1971. The plight of the Paradise Flycatcher. *J. Seychelles Soc.* 7: 8–11.
Fraser, W. 1972. Notes on *Terpsiphone corvina. Ibis* 114: 399–401.
Gaymer, R., Blackman, R. A. A., Dawson, P. G., Penny, M. & Penny, C. M. 1969. The endemic birds of Seychelles. *Ibis* 111: 157–176.
Gilliard, E. T. & Lecroy, M. 1966. Birds of the Middle Sepik Region. *Bull. Amer. Mus. Nat. Hist.* 132: 245–276.
Hall, B. P. & Moreau, R. E. 1970. An Atlas of Speciation in African Passerine Birds. British Museum (Natural History): London.
Holyoak, D. T. & Thibault, J.-C. 1977. Habitats morphologie et inter-actions-écologiques des oiseaux insectivores de Polynésie orientale. *L'Oiseau et R.F.O.* 47: 115–147.
Keast, A. J. 1958. Variation and speciation in the Australian flycatachers (Aves: Musicicapinae). *Rec. Austr. Mus.* 24: 73–108.
Moreau, R. E. 1949. The breeding of the Paradise Flycatcher. *Ibis* 91: 256–279.
Morony, J. J. Jr., Bock, W. J. & Farrand, J. Jr. 1975. *Reference List of the Birds of the World.* Amer. Mus. Nat. Hist.: New York.
Newton, E. 1867. On the land birds of the Seychelles Archipelago. *Ibis* Series 2 (3): 335–360.
Penny, M. 1974. *The Birds of Seychelles and the Outlying Islands.* Collins: London.
Rand, A. L. & Gilliard, E. T. 1967. *Handbook of New Guinea Birds.* London.
Skead, C. J. 1967. A study of the Paradise Flycatcher *Terpsiphone viridis* (Muller). *Ostrich* 38: 123–132.
Slater, P. 1975. *A Field Guide to Australian Birds.* Passerines. Scottish Academic Press: Edinburgh.
Snow, D. W. 1950. The birds of Sao Tomé and Principe in the Gulf of Guinea. *Ibis* 92: 579–595.
Storr, G. 1977. Birds of the Northern Territory. *Spec. Publ. West. Aust. Mus.* 7.

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A new race of *Parisoma lugens* from the highlands of Bale, Ethiopia

by C. Erard

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In the material brought back from Ethiopia by various expeditions organised by the Laboratoire de Zoologie (Mammifères et Oiseaux), Muséum National d'Histoire Naturelle, Paris, there is a series of 15 *Parisoma lugens*. These specimens are not homogeneous, 4 of them being easily distinguishable by their dark coloration.

These 4 emanate from the mountains of Mendebo-Araenna, in the province of Bale. Three were collected at Dinsho (=Gurie, 7° 06′ N, 39° 47′ E), 27 and 31 March 1968, by a team consisting of J. Dorst, F. Roux and R. Chauvancy; and the fourth half-way between Adaba (7° 01′ N, 39° 25′ E) and Goba (7° 01′ N, 39° 59′ E), 25 February 1971, by a team comprising J. Prévost, G. Jarry and N. Follet. These birds differ biometrically (mm and gm) from others from central and western Ethiopia:—

	Wing	*Tail*	*Bill (from skull)*	*Weight*
Bale				
3 ♂♂	65·3 (64–66)	62·5 (61–64·5)	12·3 (12–12·5)	13·7 (13–14)
♀	63·5	62	12	13
Remainder				
3 ♂♂	62·0 (61–63·5)	57·2 (56·5–58)	11·7 (11·5–12)	14·7 (14–16)
8 ♀♀	62·0 (60·5–64)	58·4 (57–61)	11·9 (11·5–12·5)	15·7 (14–18)

Thus they are larger but lighter than birds of the nominate race, described from Simien. The increase in size is not surprising, for they were collected at altitudes between 3,500 and 3,700 m, the others between 1,600 and 2,100 m.

Although they must be stressed, it was not only these biometric differences which attracted attention. As already indicated, we were particularly struck by the colour of the Bale birds. It is significant that the collectors themselves were puzzled and hesitant in arriving at a species determination.

Three geographic races of *Parisoma lugens* are recognised on the basis of colour variation by White (1962: 737):—

P. l. lugens (Rüppell), of the Ethiopian plateaux.

P. l. jacksoni Sharpe (Synonym *P. l. clara* Meise), from the southeastern Sudan and Kenya south to Malawi and southeastern Zaire. Upperparts uniformly sepia-brown, whereas in the nominate race the crown is still more dark and sepia than the back.

P. l. prigoginei Schouteden, northwest of Lake Tanganyika. Upperparts more olive-brown, the crown contrasting with the back, and above all the chest much washed with grey.

For a more precise distribution of *P. lugens*, reference must be made to Hall & Moreau (1970: 201), in which however the Ethiopian specimens recorded by Erlanger (1907: 53) are not shown, and are as follows: ♀, 30.iii.1900, Gara Mulata (9° 05′ N, 41° 30′ E), west of Harar; ♂, 11.xii. 1900, Abela (7° 01′ N, 38° 31′ E), near Lake Awasa; ♀, 7.ii.1901, Ireso (c. 7° N, 39° 15′ E), near Dodola, Arussi-Gallaland; unsexed, 19.ii.1901, Ghinir (7° 06′ N, 40° 40′ E), Bale. These specimens, except that from Abela, still exist in the collection of the Forschungsinstitut Senckenberg, Frankfurt-am-Main, and we have been able to examine them.

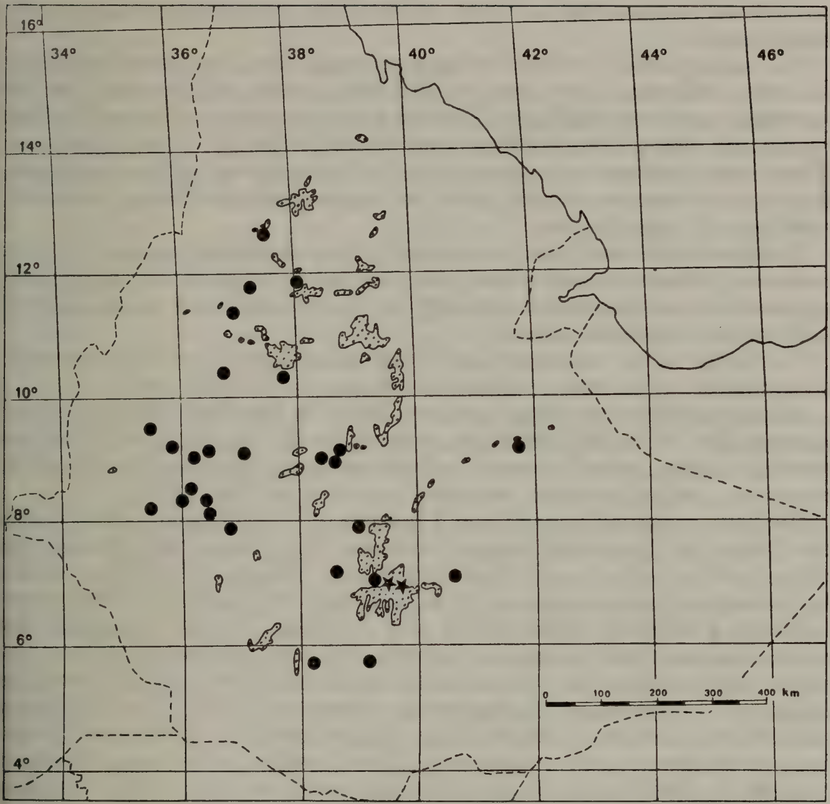

Figure 1. Ethiopian localities from which specimens of *P. lugens* have been examined. Round: *P. l. lugens*. Asterisk: *P. l. griseiventris*. Dotted areas: above 3,000 m.

Not having sufficient comparative material in Paris, we have studied the long series in the British Museum (Natural History), Tring, paying particular attention to variability in the Ethiopian populations of the nominate race, of which we have examined 40 specimens, well spread over its area of distribution (Fig. 1). It is plain that the Bale birds do not belong to the same subspecies as the others from Ethiopia, differing in a number of characters.

The upperparts of the Bale birds are very dark, blackish sepia, the crown and the mantle appearing practically concolorous. In individuals of the nominate race, the sepia crown contrasts more or less clearly, always to some extent, with the paler, less blackish, back. No *lugens* examined has the upperparts so dark and uniform.

Mackworth-Praed & Grant (1955: 174) consider the contrast between the crown and the mantle in nominate *lugens* as a character of youth, an opinion which we cannot support. As noted from a specimen collected on 27 September 1971 at Ghimbi (9° 12′ N, 35° 50′ E), in Wollega, and which still showed yellow gape-flanges, the immature plumage is characterised by a very pronounced rufous tone superimposed on the brown of the upperparts (including the crown), rufous also being apparent on the margins of the wing

coverts and remiges, and as a wash on the flanks, lower abdomen and under tail-coverts.

The underparts of the Bale birds are generally very grey (scarcely paler on the lower abdomen), not white washed with greyish buff on the chest and brownish on the flanks (Fig. 2). The chin and upper throat are mixed blackish brown and whitish, but the appearance is darker than in the nominate race. There is less contrast in comparison with the remainder of the underparts, due to the throat as a whole, chest and upper abdomen being indistinctly streaked with grey-brown.

The lower abdomen, inner flanks and under tail-coverts show a very clear reduction, almost absence of buff, this tone being much diluted, only barely apparent on the lowermost extremity of the abdomen and as an indistinct wash on the under tail-coverts.

The white on the outer rectrices is more greyish and, especially, less extensive, notably on the inner web and at the apex of the outer web.

All these differences from nominate *lugens* as described above are even more evident if the Bale birds are compared with *jacksoni*, also well represented in Tring, since *jacksoni* is paler than *lugens*. However, they have in common a lack of contrast between the crown and the mantle.

We have examined 2 males and 2 females of *P. l. prigoginei*, preserved in the Musée de l'Afrique Centrale, Tervuren. They show the characters as given by Schouteden (1952). On the underparts, this race is well characterised by its blackish brown chin scarcely marked with white, and its greyish chest, contrasting with the white throat and abdomen. On the upperparts the crown contrasts with the back in being darker. The outer rectrices have less white than in *lugens* or *jacksoni*, as emphasised in Dowsett & Prigogine (1974: 36). Furthermore, in *prigoginei* the upperparts, flanks, lower abdomen and under tail-coverts are more rufous in tone than in the other races, resulting in a brighter, warmer appearance. Thus *prigoginei* shows some tendency towards the Bale birds in its greyish chest, yet not so dark, and in the reduction of white on the outer rectrices.

However, as the following measurements (mm) show, *prigoginei* is even larger, with a robuster bill, than the Bale birds:—

	Wing	*Tail*	*Bill (from skull)*
2 ♂♂	68–69·5	60–63	13·5–15
2 ♀♀	68–69·5	62·5–63	14·5–15

The Bale birds are equally distinct in colour, by being uniformly very grey on the underparts, with much more matt, darker, colder tones, lacking any rusty on the upperparts, and by an extreme reduction of buff on the flanks, lower abdomen and under tail-coverts.

Thus the specimens from the highlands of Bale represent a distinct taxon which we propose to name:

Parisoma lugens griseiventris subsp. nov.

Diagnosis: The darkest race. Upperparts uniformly dull blackish sepia; underparts grey, white barely apparent, with a significant reduction of buff on the lower abdomen and under tail-coverts.

Type: Adult ♂, collected at Dinsho (=Gurie), Bale, Ethiopia, 31 March 1968, by a team composed of Prof. J. Dorst, F. Roux and R. Chauvancy, collectors' no. 236; in Paris Museum, reg. no. C. G. 1977–827.

Measurements and weight of type: Wing 64, tail 61, bill 12·5 mm, weight 13 g.

Distribution: High altitudes in the mountains of Mendebo-Araenna, province of Bale, southeastern Ethiopia.

Remarks: Erlanger's 3 remaining specimens (the one from Abela has disappeared) are interesting from their geographical situation, for they are near the eastern edge of the Ethiopian distribution (Fig. 1). According to Erlanger's itinerary (*J. Orn.* 52, 1904, suppl.: general map and map 2), these localities are all situated at altitudes well below 2,500 m, in fact near to 2,000 m, even 1,500 m in the case of Ghinir. The 3 specimens belong without question to the nominate race, including the one from Ireso only c. 20 km from Adaba. The change from the pale nominate race to the dark, montane, *griseiventris* is thus sharp, possibly without any intergradation. Not only is *griseiventris* very distinct in colour (also large-sized, albeit lighter in weight), but also in ecology, more particularly in habitat.

The nominate race, according to the evidence obtained by the various expeditions of the Paris Museum, frequents open or slightly enclosed biotopes, but always wooded; light wooded savannas of a humid type, interspersed with shrubs (especially of *Acacia*); edges of degraded forest; gallery forests with *Ficus* and *Acacia* trees. In such places *Acacia* is always present, and from it the bird seems inseparable: cf. also Cheesman & Sclater (1935: 599), Benson (1946: 182–183), Urban & Brown (1971: 93).

P. l. jacksoni apparently has a similar association, and is no less strictly linked to *Acacia* growth than nominate *lugens*, judging for example from the information in Jackson (1938: 910), Benson (1950: 36), Chapin (1953: 601), Dowsett & Prigogine (1974: 36) and Benson & Benson (1977: 20, 153). Like *lugens*, *jacksoni* seems not to occur anywhere above 2,500 m. Indeed it appears to be no more than occasional above 2,000 m, in degraded forest, as with *lugens* on the Ethiopian plateaux.

P. l. prigoginei is included by Prigogine (1975: 85) in his list of subalpine forms, with an altitudinal distribution from 2,620 to 3,220 m in Itombwe, where it inhabits watercourses in bushy savanna (Prigogine 1971: 185). In that area the highest summit—Mount Mohi—reaches 3,475 m. Prigogine (pers. comm.) has not personally observed *prigoginei* in life, and has no precise notes on its habitat. However, this race is undoubtedly associated with the subalpine zone in view of the altitudes of collecting localities. Bamboos and heaths do not generally occur above 3,000 m, giving way higher to a short herbaceous growth dominated by such afro-alpines as *Helichrysum*, *Alchemilla* and *Senecio*. Thus the Itombwe race must be associated with a vegetation series only just below the afro-alpine stage.

P. l. griseiventris is the most montane race, frequenting altitudes above 3,500 m. Its habitat lies in the upper montane vegetation series, in woody moorlands dominated by *Erica*, *Euphorbia* and *Hypericum* (for a description of the environment around Dinsho, cf. Dorst & Roux 1972). In movements and vocalisations it is like a *Sylvia* warbler, as much in the top of shrubby vegetation (notably heaths) as in frutescent tufts. This ecological localisation is very different from that of *lugens* and *jacksoni*. Despite the lack of precise information from Itombwe, it would seem that the habitats of *griseiventris* and *prigoginei* may be very similar, if not identical, both different from those of the other two races, their presence not tied to that of *Acacia*.

In Zaire the forms *prigoginei* of Itombwe and *jacksoni* of Marungu are

geographically widely separated. By contrast, in Ethiopia *lugens* and *griseiventris* occur close to one another, the latter being almost surrounded by the former (Fig. 1). So the altitudinal separation between the two forms needs stressing. *P. l. griseiventris* is seemingly isolated from *lugens* by a belt of forest suitable to neither. This occupation of different, well separated, altitudinal zones, as well as the profound habitat-difference, poses the question of a possible reproductive isolation between the two forms. Only precise eco-ethological studies on the ground will permit a solution. Attention should be paid in particular to possible voice-differences.

There seem to be no differences in the nature and size of the food taken by the two Ethiopian forms. Out of 11 stomachs of *lugens* examined, 10 contained small caterpillars 10 to 20 mm long, 3 the chitinous debris of small insects, one of spiders, and another of aphids. The 4 stomachs of *griseiventris* also contained small caterpillars (3), small insects (2), and one showed some vegetable debris. Not much is known about the diet of *jacksoni* except that Jackson (1938: 910) found seeds and small berries in the stomachs of 2 males, and Chapin (1953: 601) states that the food consists of insects, occasionally varied by berries.

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References:

Benson, C. W. 1946. Notes on the birds of southern Abyssinia. *Ibis* 88: 180–205.
— 1950. The Brown Tit-babbler and the Blackcap in Nyasaland. *Bull. Brit. Orn. Cl.* 70: 35–37.
Benson, C. W. & Benson, F. M. 1977. *The birds of Malawi.* Limbe, Malawi: D. W. K. Macpherson (Sponsor).
Chapin, J. P. 1953. The birds of the Belgian Congo. Part 3. *Bull. Amer. Mus. Nat. Hist.* 75A.
Cheesman, R. E. & Sclater, W. L. 1935. On a collection of birds from north western Abyssinia, Part III. *Ibis* 13 (5): 594–622.
Dorst, J. & Roux, F. 1972. Esquisse écologique sur l'avifaune des monts du Bale, Ethiopie. *L'Oiseau et R.F.O.* 42: 203–240.
Dowsett, R. J. & Prigogine, A. 1974. The avifauna of the Marungu highlands *in* J. J. Symoens (edit.): *Exploration hydrobiologique du bassin du lac Bangweolo et du Luapula,* Bruxelles, Vol. XIX: 1–67.
Erlanger, C. F. von. 1907. Beiträge zur Vogelfauna Nordostafrica. V. *J. Orn.* 55: 1–58.
Hall, B. P. & Moreau, R. E. 1970. *An Atlas of Speciation in African Passerine Birds.* London: Brit. Mus. (Nat. Hist.).
Jackson, F. J. 1938. *The Birds of Kenya Colony and the Uganda Protectorate.* Vol. 2. London: Gurney & Jackson.
Mackworth-Praed, C. W. & Grant, C. H. B. 1955. *Birds of Eastern and North Eastern Africa.* Vol. 2. London: Longmans.
Prigogine, A. 1971. Les oiseaux de l'Itombwe et de son hinterland. *Ann. Mus. Roy. Afr. Centr. Tervuren* 185: 1–298.
Prigogine A. 1975. Contribution a l'étude de la distribution verticale des oiseaux orophiles. *Gerfaut* 64: 75–88.
Schouteden, H. 1952. *Parisoma lugens Prigoginei* n. ssp. *Rev. Zool. Bot. Afr.* 46: 171–173.
Urban, E. K. & Brown, L. H. 1971. *A Check-list of the Birds of Ethiopia.* Addis Ababa: Haile Sellassie I University Press.
White, C. M. N. 1962. A check list of the Ethiopian Muscicapidae (Sylviinae). Part II. *Occ. Pap. Nat. Mus. S. Rhod.* 26B: 663–738.

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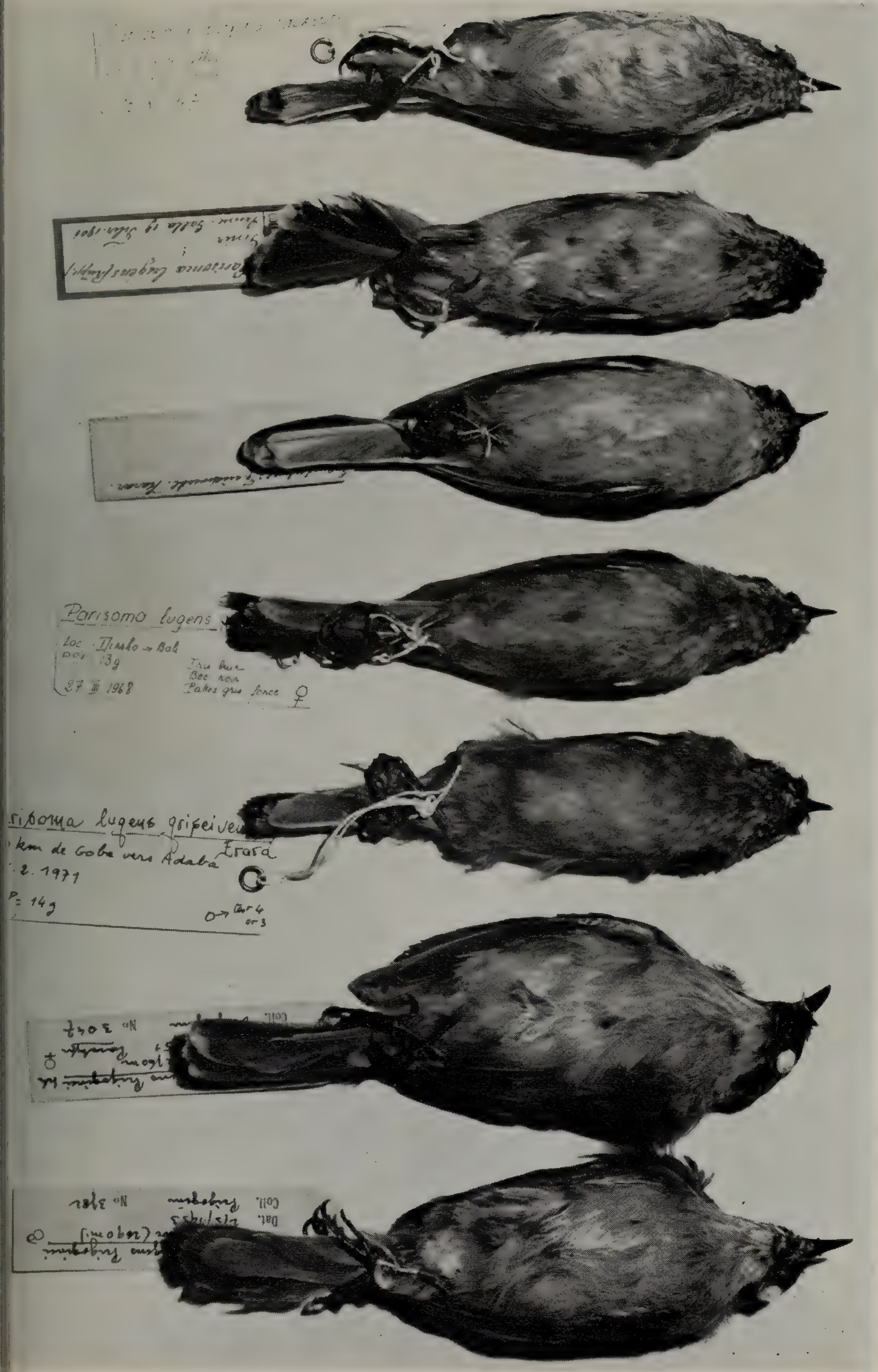

Figure 2. Races of *Parisoma lugens*. Above downwards: one *jacksoni*, two *lugens*, two *griseiventris* (subsp. nov.), two *prigoginei*.

The undescribed female of Harwood's Francolin *Francolinus harwoodi* and other observations on the species

by J. S. Ash

Received 28 October 1977

Figure 1. Under parts of *Francolinus harwoodi* illustrating slight sexual dimorphism in this species: female above, male below.

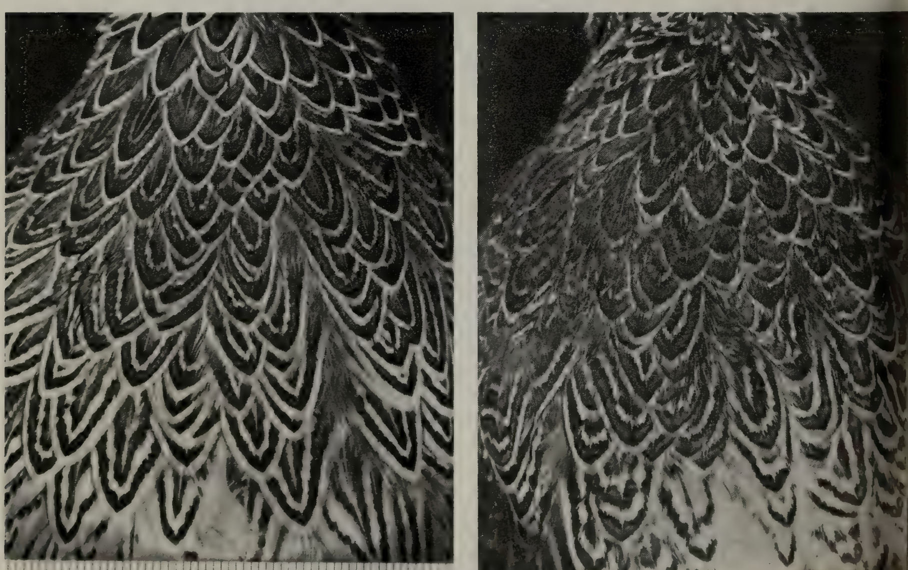

Figure 2. *Francolinus harwoodi* breast feathers: left—male, right—female. Scale in tenths of an inch.

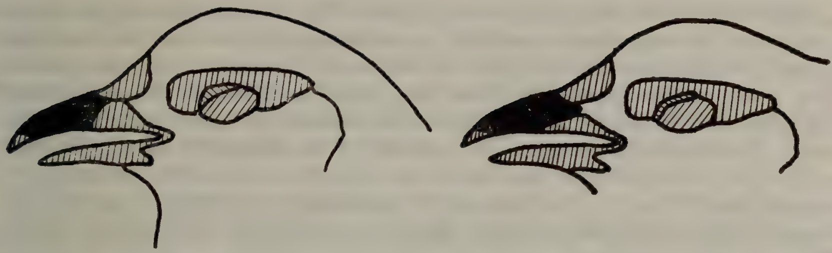

Figure 3. The distribution of colours on the mandibles of *Francolinus harwoodi*; the shaded areas are red, the solid areas are black. ♂ left, ♀ right.

Harwood's Francolin *Francolinus harwoodi* is one of the rare and virtually unknown birds of Africa (Hall & Moreau 1962). Until recently it has been known from only 3 specimens collected in the last 78 years in the Blue Nile gorge in north central Ethiopia. All were males. The purpose of this paper is to detail 4 more specimens (one male and three females), to describe the previously unknown female, and to discuss sightings of apparently similar birds over a much wider area of central Ethiopia. The 7 specimens collected so far (Table 1) are from 4 localities in the Blue Nile gorge or its tributaries. The type locality (Ogilvie-Grant 1900) Aheafeg (=Ahaia Fej=Haiafegg; Amharic for donkey killer) is 49 km northeast of where I collected in the Jemmu Valley; Cheesman & Sclater's (1935) localities near Bichana and at Kalo Ford are respectively 87 km northwest and 102 km to the west of the Jemmu site. Of the 4 new specimens, one was an adult male, 2 were first year females and one an adult female. Age was determined, as in other francolins, by the shape of the 2 outermost primaries. In juveniles the primaries are pointed, not rounded as in adults, and the 2 outermost are retained through the first pre-basic moult until the birds are about 14 months old.

Description of the male and female *Francolinus harwoodi*

The Jemmu male, with which the Jemmu female needs to be compared, differs in some respects from the original description and plate of the type specimen (a male), in Ogilvie-Grant & Lovat (1900), perhaps due to the colour printing or to a change in colour values with time. The whole of the upperparts of the Jemmu male skin is a greyer tone of brown than the type in their plate, and the buff on the underparts is paler; both new and old feathers on the lower neck and upper breast have narrower white edging so that the general effect is darker; the red on the mandibles, round the eye and the legs, is darker, and the bare patch round the eye more extensive.

The female is very similar to the adult Jemmu male; sexual dimorphism is not at all emphatic. Over the whole of the upperparts, the female is slightly browner than the male, which is greyer and colder in tone. In all sex and age plumages the barring of the upperparts is indistinct, but in the female it is more pronounced, though the pale fringes to the feathers, probably as a result of wear, are, in fact, less distinct. Similarly on the underparts (Fig. 1), all the darker markings are browner in the female and greyer in the male, although their distribution is the same. The breast feathers are more pointed in the male than in the female and their pattern is more contrasting. In the centre of the underparts the male has scattered feathers with dark fairly large U-shaped markings, whereas the female has only small v-shaped

marks, which tend to form bars on the flanks (Fig. 1)—but these slight differences may be individual, especially as comparison shows that the first year female's underparts are intermediate between the adult male and female. The whole of the upperparts of the first-year female is very close to that of the adult female except the barring is less distinct, and thus approaches the male. The female lacks spurs. The colours of the mandibles of all 3 females at death were very similar, but that of the male showed a rather less extensive area of black (Fig. 3). The testes of the adult male measured 10×4 mm, the largest follicle in the adult female was $<1 \cdot 5$ mm and in the first year female it was 3 mm.

Distribution

It is reasonable to suppose from my experience that the species occurs in the country in between the present known localities, and probably outside. Cheesman commented that the local people knew it well in the Bichana area, and I found that in the Jemmu Valley, which is partly cultivated for sorghum after the rains by the surrounding highland people, it was said to be common 'up and down the river'. Prior to 1977, I had seen possible *F. harwoodi* in this area on 6 April 1974 and 11/12 January 1975: but my misgivings were due to rather similar birds, seen at Gibe Gorge and elsewhere (see below) which did not entirely agree with descriptions of this species. However, Tyler & Tyler (1975) saw up to 6 francolins at the same Jemmu site on 5–7 January 1975, which they confidently identified as *harwoodi*. I decided that certain identification rested on the collection of specimens, for which a male was required, and that an attempt should also be made to collect the undescribed female if the male proved to be *harwoodi*. In a careful search of the Jemmu area in February 1977 at least 40 birds were present and the specimens were obtained.

Unidentified francolins were seen in the course of several visits to the Gibe Gorge (8° 15′ N, 37° 35′ E, 1696 m), at c. 250 km SW from Jemmu, at different times of the year from May 1971 onwards. This is on the border of Shoa and Kaffa Provinces, about 185 km south of the nearest *F. harwoodi* locality. I suspected, from a bird seen closely on 7 November 1971, that these also were Harwood's Francolins. The habitat on the gentle northerly slopes of the valley there is open *Combretum/Terminalia* woodland in high dense *Hyparrhenia* grassland. The birds were extremely difficult to see well, although they were often heard in the dense grass, and attempts to obtain a specimen failed. *F. clappertoni*, which has a somewhat similar call to *F. harwoodi*, was ruled out by the absence of a pale supercilium, the absence of a white throat, which was grey and heavily streaked in the Gibe Gorge birds, and by the lack of distinctly patterned upperparts. However, the more heavily blotched appearance of the breast suggested *clappertoni* rather than *harwoodi*. The legs were red, and on one bird whose mandibles were seen well both upper and lower were black with a red base to the latter. The mantle appeared to be a uniform dark brownish colour and because no barring was seen it was thought that they may not have been *F. harwoodi*. Since then I have realized that the barred upperparts of *harwoodi* are not clearly discernible in the field.

From a vehicle on 16 April 1975, at c. 450 km to the WSW of Jemmu, I saw 4 francolins looking very like the Gibe birds, at 39 km northeast of

Dembidollo at 8° 47′ N, 35° 00′ E in Illubabor Province. This was an area of mixed shrubs and cultivated patches on the plateau at 1340 m. Bill colouration was not seen, otherwise they matched the description of the Gibe Gorge birds except that the feathers of the mantle had pale edges.

Whether these more southerly and westerly birds are *F. harwoodi* awaits determination by better field observations, or preferably specimens.

Habitat

Mackworth-Praed & Grant's (1952) 'probably only found among the cliffs of the Blue Nile gorges southwest of Lake Tana' is misleading. Both the original and the recent records are from localities between southeast and south-southeast of Lake Tana. In addition, besides there being no other observations on habitat, in the Jemmu Valley I have never seen these francolins anywhere near the few low cliffs which exist there. There they live in dense and extensive *Typha* beds growing in the gravelly bed of a stream flowing into the Jemmu River. The *Typha* beds were c. 0·5 km wide and 2–3 km long; the stream was very shallow and divided into several branches, which as they receded in the dry season left numerous small pools behind. Also in the *Typha* there are several scattered trees, some pollarded, into which some *F. harwoodi* were seen flying when it was almost dark, evidently to roost, although most of them roost below the tops of the *Typha*, but not necessarily on the ground.

Voice

In February there was a lot of calling from birds in the *Typha*, starting about 20 minutes before sunrise and continuing for 2–3 hours whilst the birds emerged to feed in the adjacent sorghum stubble. Calling was also heard for a short time just before sunset. The call was a loud rasping 'koree', not unlike that of *F. clappertoni*. Birds disturbed in the open always flew straight back into the *Typha*, but unlike some francolins in other habitats (see below) allowed fair observation whilst feeding, though without close approach. During the hotter part of the day birds were disturbed from deep shade in the *Typha* either under trees or below low brush.

Breeding

There is no previous breeding data, so it is of interest to record a brood of 3 young about 5 weeks old (estimated on the basis of much previous experience with Common Partridges *Perdix perdix*) on 20–21 February 1977. From this it can be deduced that the first egg was laid in the second week of December.

Relationships

Hall (1963) included in the vermiculated group of francolins, *bicalcaratus*, *icterorhynchus*, *clappertoni*, *hildebrandti*, *natalensis*, *hartlaubi*, *harwoodi*, *adspersus* and *capensis*, and claimed that the first 6 of these formed a superspecies. *F. harwoodi* is most like *F. natalensis*, which is a species showing rather more sexual dimorphism. The upperparts of male *F. hildebrandti* are actually nearer to *harwoodi* than those of *harwoodi* are to *natalensis*, but there is marked sexual dimorphism in *hildebrandti* in which the females are very different below from the males. The degree of dimorphism in *F. harwoodi* is even less.

In the Jemmu Valley area, *F. harwoodi* comes in contact with no francolins except probably *F. erckelii*, which is common on the slopes of the gorge.

It is isolated from *F. p. psilolaemus*, which is common on the open grassland above the gorge, and by at least 50 km from populations of *F. clappertoni*, which is the nearest member of Hall's vermiculated group.

The Jemmu Valley is unique in my experience in Ethiopia in possessing elements of lowland western species together with typical highland species. The lowland species include *Streptopelia vinacea*, *Cisticola troglodytes ferruginea*, *Sporopipes frontalis*, *Petronia dentata* and *Euplectes hordeaceus*; the highland species include *Motacilla clarus*, *Streptopelia lugens* and *Poicephalus flavifrons*. Clearly the highland species overspill into the valleys from the surrounding high plateau, but some of the lowland species are a long way to the east of their known range. Presumably they extend all the way up the Blue Nile gorge and its tributaries, and only further investigation in this little known area will show whether their distribution is continuous or if this is an isolated population in the Jemmu Valley.

Food

One crop contained many small tubers of what was probably a species of *Dioscorea*. Two gizzards contained a similar tuber, many termites, grit, and the following seeds: 2 *Echinochloa* sp., possibly *E. crusgalli* var. *frumentacea*; 11 *Commelinaceae* and fragments; 2 *Amaranthus* sp. and 9 unidentified berry-like fruits, together with other fragments.

Conclusion

Francolinus harwoodi need no longer be considered the very rare bird that it was formerly thought to be, and there is no reason to believe that it is at any particular hazard. The known distribution of certainly identified specimens is confined to an area extending for 150 km from west to east and for 64 km from north to south. If other unconfirmed sight records are included the range is extended 320 km to the west and 185 km to the south.

Table 1

Details of the seven known specimens of *Francolinus harwoodi*.

	a	*b*	*c*	*d*	*e*	*f*	*g*
Locality	Aheafeg	nr. Bichana	Kalo Ford	Jemmu River	Jemmu River	Jemmu River	Jemmu River
Coordinates	10° 13′ N, 39° 18′ E	10° 26′ N, 38° 16′ E	9° 54′ N, 37° 57′ E	9° 58′ N, 38° 55′ E	9° 58′ N, 38° 55′ E	9° 58′ N, 38° 55′ E	9° 58′ N, 38° 55′ E
Altitude (m)	?	<2424	1667	1290	1290	1290	1290
Date	7.ii.1899	14.ii.1927	12.v.1930	20.ii.1977	20.ii.1977	21.ii.1977	21.ii.1977
Age/Sex	1 y ♂	1 y ♂	Ad ♂	1 y ♀	Ad ♀	1 y ♀	Ad ♂
Wing (mm)*	180	185	185	(161)	165	165	177
Tail (mm)*	83	—	86	—	72	73	75
Tarsus (mm)*	53	57	58	—	46	46·5	55
Culmen (mm)*	30	30	31	—	26	24	28
Weight (g)	—	—	—	413·5	445·5	438·0	545·0
Iris	Brown	—	—	Blackish-brown	—	Blackish-brown	Blackish-brown
Mandibles	red	lower bright vermilion	lower bright vermilion	see Fig. 1	see Fig. 1	see Fig. 1	see Fig. 1
Tarsus	red	bright vermilion	bright vermilion	red	red	red	red
Authority†	O-Grant 1900	C & S 1935	C & S 1935	Ash	Ash	Ash	Ash
Specimen‡	B.M.	B.M.	B.M.	Ethiopia	S.I.	S.I.	S.I.
Cat. No.	1900.1.3.396	1927.11.5.18	1934.12.16.67	—	569267	569266	569268

Notes:

* to obtain consistent museum measurements specimens a, b, and c were measured by P. R. Colston at the British Museum and e, f, and g by G. E. Watson at the Smithsonian Institution; my measurements in the flesh were 2–3 mm longer so that the wing of d, would be nearer 159. The measurements for tail, tarsus and culmen were made similarly. (b has no tail.)

† C & S = Cheesman and Sclater (1935).

‡ indicates location of specimens. BM = British Museum of Natural History, Tring; SI = National Museum of Natural History, Smithsonian Institution, Washington, D.C.; Ethiopia = this bird had to be left in a freezer, now at the Central Laboratory in Addis Ababa, and its ultimate fate is uncertain.

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References:

Cheesman, R. E. & Sclater, W. L. 1935. On a collection of birds from northwestern Abyssinia. *Ibis* Series 13(5): 151–191.

Hall, B. P. 1963. The Francolins, a study in speciation. *Bull. Brit. Mus.* (*Nat. Hist.*) *Zool.* 10(2): 107–204.

Hall, B. P. & Moreau, R. E. 1962. A study of the rare birds of Africa. *Bull. Brit. Mus.* (*Nat. Hist.*) *Zool.* 8(7): 313–378.

Mackworth-Praed, C. W. & Grant, C. H. B. 1952. *Birds of Eastern and North Eastern Africa*. Longmans: London.

Ogilvie-Grant, W. R. 1900. *Francolinus harwoodi*, sp. n. *Bull. Brit. Orn. Cl.* 10: 22–23.

Ogilvie-Grant, W. R. & Lovat, Lord. 1900. On the birds collected during an expedition through Somaliland and southern Abyssinia on the Blue Nile, Part 2. *Ibis* Series 22(7): 304–337.

Tyler, L. & Tyler, S. J. 1975. Recent bird records—for January. *Eth. Wildlf. N. H. S. Newsletter* 94:5.

Postscript:

While the above was in proof, I received from M. A. Traylor and D. E. Willard a list of specimens taken by Fuertes and Osgood in Ethiopia, now in the collection of the Field Museum of Natural History, Chicago. Included are 4 *Francolinus harwoodi*, apparently all adults, from the Muger River valley at 1515-1757 m on 12 February 1927. The catalogue numbers for the 3 males and one female are 68985, 68986, 75363 and 75364 respectively. From the account of the expedition the collecting site must have been at 9°28′N, 38°36′E, which is 67 km southwest of the Jemmu site and 87 km southeast of the Kalo Ford. The distribution of certainly identified specimens now extends for 150 km from west to east and for 108 km from north to south.

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Description, moult and measurements of *Montifringilla theresae*

by Brian Wood, S. C. Madge, and C. S. Waller

Received 17 November 1977

Probably due to its remarkably circumscribed range (Vaurie 1959, Vasic 1974), knowledge of Theresa's Snow Finch *Montifringilla theresae* is incomplete and based on only a few casual records (Meinertzhagen 1937, Paludan 1959, Dementiev 1963, Niethammer 1967). Therefore it seems worth recording observations of this species made during the Oxford University Ornithological Expedition to Afghanistan and Kashmir 1970, although these also are fragmentary.

During late July we encountered small flocks of Theresa's Snow Finches in undulating and arid country between the Nil Kotal and Band-i-Amir in central Afghanistan. They were particularly common in the valley at Band-i-Amir (67° 12′ N, 34° 50′ E) usually feeding in parties on the lower scree slopes below cliffs flanking the valley. Although Common Snow Finches *Montifringilla nivalis* also occurred here, the two species only occasionally formed mixed flocks, and *M. nivalis* was more usually encountered in rockier habitat.

Between 4 and 12 August 1970 we mist-netted 41 Theresa's Snow Finches by a small stream flowing into the Band-i-Amir lakes, where they came to drink and bathe, along with many Common Snow Finches, Crimson-winged Finches *Rhodopechys sanguinea*, Desert Finches *Rhodopechys obsoleta* and Horned larks *Eremophila alpestris*. All Theresa's Snow Finches were weighed to the nearest gram on a Pesola balance, measured and details of plumage and moult noted before being ringed (with rings supplied by the Bombay Natural History Society) and released. Three of these were subsequently recaptured during the same 8-day period.

Whilst our sample undoubtedly contained adult males, females and birds of the year, without an adequate reference description to guide us we were unable to age and sex each bird caught. The details noted enabled some birds to be sexed, however, by comparison with details of birds sexed later by dissection. Weights and wing lengths (Fig. 1) are compared with published figures. A wide range of weights is apparent, our's being mostly lower than those of birds caught in Turcomania during the winter (Dementiev 1963), but many also are less than those of breeding Theresa's Snow Finches from the Unai pass in Afghanistan (Niethammer 1967). Wing lengths are also diverse, but appear to correlate with sexual difference, males being the larger, confirmed by differences in colouration of plumage and soft parts.

A full description was taken of the first Theresa's Snow Finch that we caught, and is recorded here as previous descriptions are incomplete and appear to be based on dead specimens (Meinertzhagen 1937, Dementiev & Gladkov 1954, Dementiev 1963):—

Wing 88 mm. Weight 22 gm. Bill from skull 15 mm, from feather edge 12 mm. Nostril width 6 mm. Tarsus 19·5 mm. Wing formula: Wing point=3rd primary; 2nd, ½ mm less; 4th, 4 mm less; 5th, 11 mm less, remainder in moult. First primary minute, much shorter than coverts. Tail: 3rd, 4th and 5th retrices longest (numbered centrifugally), outermost (6th) 4·5 mm less, central (1st) 4·5 mm less, 2nd, 2 mm less.

Upper mandible grey-brown horn, slightly yellower on ridge. Lower mandible yellow, brownish-blue horn at tip. Iris brown. Legs and feet blackish. Crown, nape, mantle and upper back buff. Scapulars with blackish-brown mark on lower half of outer webs. Upper tail coverts buff-grey.

Primaries blackish-grey. 2nd, 3rd and 4th primaries with faint white outer margin, most noticeable on 2nd; also faint white mottling on inner web below primary coverts. 5th to 10th primaries with white outer margin and white mark on inner web below primary coverts. Primary coverts and alula blackish with brownish margins. Secondary coverts buff-brown with buff-white margins. Tertials blackish-brown with buff-white margins. Inner web of median coverts off-white with buff margin, outer web brown with buff margin. Lesser coverts grey with buff margins. 12 retrices, mainly blackish-grey. Outer retrices with white outer margin, black shaft and the inner web with large white patch at tip. Penultimate retrices white, streaked grey on outer margin and a black spot at tip with white margin.

Judging by its wing length this bird was a female. Its bill colour, grey upper and yellow lower mandibles, is also characteristic of the bill colour of females of other species of *Montifringilla*.

Whilst descriptions were not taken of the other Theresa's Snow Finches caught, some characteristics of a few birds were noted. Thus, two birds were noted as possessing the "black mask" characteristic of adult males of this species, two had the iris brick-red and several were recorded as having an all dark grey bill, rather than the "two-toned" bill of the bird described above (see Fig. 1). Birds with all dark grey bills and those with "two-toned" bills occupy opposite halves of the range of wing length recorded, corresponding

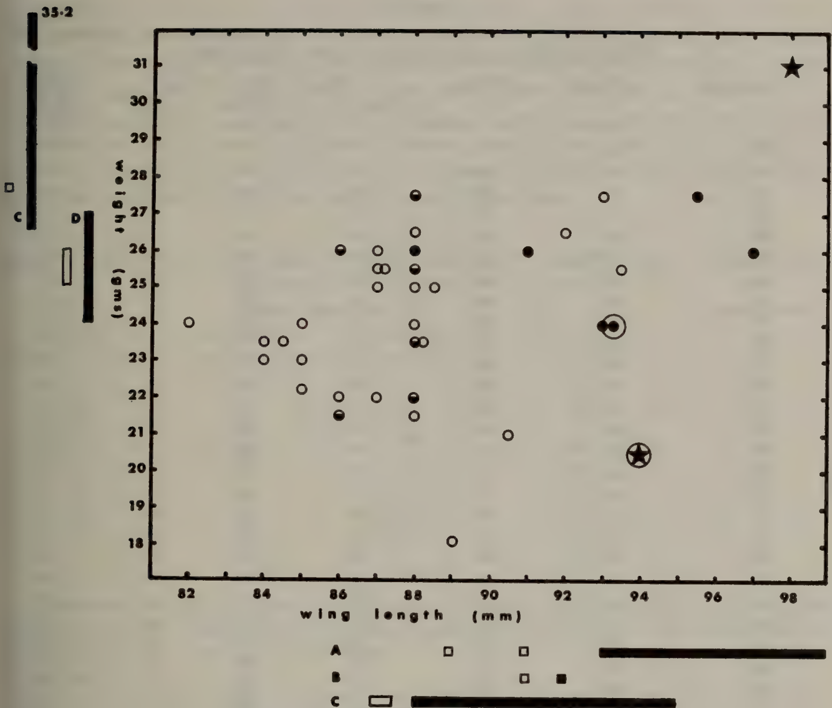

Figure 1. Weights and wing-lengths of *Montifringilla theresae* caught at Band-i-Amir, Afghanistan, compared with published data.
Band-i-Amir data: solid symbols ● = birds with all dark grey bill; half-shaded symbols ◒ = birds with grey upper mandible and yellow lower mandible; open symbols ○ = bill colour not noted. Stars ★ = birds with 'black mask'; Large circles O = birds with brick red iris.

Published data: solid symbols ■ = males; open symbols □ = females.
Sources: A, Meinertzhagen 1937; wing length of 5 males and 2 females
B, Dementiev & Gladkov 1954; wing length of 1 male and 1 female
C, Dementiev 1963; wing length of 8 males and 2 females, weight of 7 males and 1 female
D, Niethammer 1967; weight of 7 males and 4 females

closely to previously recorded ranges of wing length of males and females respectively. Birds having a "black mask" and those with a brick-red iris also fit the male wing length range. Thus an all dark grey bill and a brick-red iris appear to be male characteristics, apparently previously undescribed for this species, but possibly confined to adult birds. However, one of us (CSW) possesses a colour slide of a bird in female or juvenile plumage which appears to have a brick-red iris, so this characteristic may prove unreliable for sexing.

Birds which were evidently adult males also showed more white on the wing, both on remiges and median coverts, especially in flight. In females and juveniles the white was dull and appeared dirty in comparison.

TABLE 1

Measurements (mm), weights (gm) and moult scores of Theresa's Snow Finches *Montifringilla theresae* caught at Band-i-Amir, Afghanistan.

Wing length	*Weight*	*Primary*	*Moult scores (as a %)*† *Secondary*	*Tertial*	*Tail*	*Contour moult**
88[1]	22	—	—	—	—	—
87·5[2]	—	44	0	27	0	x
90·5[3]	21	40	0	—	—	—
89[4]	18	26	0	0	0	0
88·5[5]	25	34	0	47	0	0
87	25·5	34	0	0	0	x
84	23·5	42	0	13	13	x
84	23	42	3	27	13	x
87	26	42	0	0	7	0
87	25·5	48	0	0	10	0
87	25	42	0	27	17	x
88	26	36	0	47	—	—
88	26·5	40	0	47	10	—
88	25	40	0	40	13	xx
87	22	46	0	40	7	xx
88	24	—	—	—	—	—
95·5	27·5	56	7	40	—	x
93	24	66	7	47	50	0
88	23·5	18	3	0	0	0
88	25·5	46	0	0	—	x
91	26	48	3	27	30	x
86	21·5	6	0	0	0	0
97	26	48	10	67	47	x
94	25·5	54	7	27	37	xx
94	20·5	58	13	60	32	xx
93	24	50	0	13	33	—
85	24	34	3	20	0	x
82	24	46	0	33	17	xx
86	26	40	3	27	—	xx
88	27·5	42	20	33	10	xx
90	27	48	27	40	23	xx
85	22	30	0	47	0	x
98	31	58	17	53	43	xx
—	19·5	18	0	0	0	—
88	21·5	22	0	0	0	—
85	23	32	0	27	—	—
84·5	23·5	38	0	20	13	—
86	22	36	0	—	3	xx
88	23·5	24	0	0	0	x
93	27·5	—	—	—	—	—
92	26·5	58	17	60	53	x

Notes. *Contour moult: o=feathers all old; x=moult starting; xx=heavy moult; — indicates data not available.

†Moult of remiges and retrices was recorded according to the method recommended by the British Trust for Ornithology (Snow 1967), but scores are here presented as a percentage of maximum possible score (=completed moult).

[1]Bill 15, tarsus 19·5, tail 48 mm.

[2]Bill 16, tarsus 20·5, tail 44 mm.

[3]Bill 15·5, tarsus 19·5, tail 48·5 mm.

[4]Bill 18, tarsus 20·00, tail 47 mm.

[5]Bill 16 mm.

Almost all the Theresa's Snow Finches were in active wing, tail and body moult. Moult scores for each of these three groups of feathers are given in Table 1. Whilst the restricted duration of our observations can provide no

information on length of moult in this species, other details are apparent. The sequence of moult appears to be normal for a passerine. Primary moult occurs first, with secondary, tertial and tail moult starting when primary moult is 30%–40% completed. Both adult and first year birds appear to undergo a complete moult in the autumn, as in the Common Snow Finch, and the timing of moult of both Theresa's and Common Snow Finches at this locality appears to coincide almost exactly (Table 2), indicating the same response to closely similar ecological requirements.

TABLE 2

Moult scores of Common Snow Finches *Montifringilla nivalis* caught at Band-i-Amir, Afghanistan. (Conventions as in Table 1.)

	Moult scores (as a %)			*Contour moult*
Primary	*Secondary*	*Tertial*	*Tail*	
56	0	0	37	—
50	3	27	10	—
42	0	13	0	xx
68	13	73	73	x
46	0	47	10	0
76	13	87	73	x
56	7	53	30	x
36	0	40	10	x
54	3	53	10	—
54	7	40	43	xx

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References:

Dementiev, G. 1963. Theresa's Ground Finch *Montifringilla therease.* Ibis 105: 107.

Dementiev, G. P. & Gladkov, N. A. 1954. *Birds of the Soviet Union.* Translation, Jerusalem 1970.

Meinertzhagen, R. 1937. Description of two new birds. *Bull. Brit. Orn. Cl.* 58: 10.

Niethammer, G. 1967. On the breeding biology of *Montifringilla theresae. Ibis* 109: 117–118.

Paludan, K. 1959. On the birds of Afghanistan. *Vidensk. Medd. Dansk naturh. For.* 122: 1–322.

Snow, D. W. 1967. A guide to moult in British birds. British Trust for Ornithology Field Guide no. 11.

Vasic, V. F. 1974. Observations ornithologiques en Afghanistan. *Alauda* 42: 259–280.

Vaurie, C. 1959. *The Birds of the Palearctic Fauna, Passeriformes.* Witherby: London.

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Notes on the biology and systematics of Polynesian swiftlets, *Aerodramus*

by D. T. Holyoak & J.-C. Thibault

Received 15 November 1977

Swiftlets of the genus *Aerodramus* (formerly placed in *Collocalia*, but see Brooke 1972, Medway & Pye 1977) are widespread in the tropical Pacific Ocean from Australia and New Guinea east to the Cook, Society and

Marquesas Islands. Some of the larger islands of the southwest Pacific have two or three coexisting species, but only one species occurs on each island from Fiji east to the Marquesas. No other Apodidae breed on islands in the central Pacific and the only swallow (Hirundinidae) is *Hirundo tahitica* which breeds from Australia east to Tahiti.

Mayr (1937) describes the slight differences in morphology and coloration which separate some sympatric species of *Aerodramus*, and the consequent difficulties in judging affinities of allopatric populations which show small but constant differences from each other. Simms (1961) and Medway (1966, 1975) have since improved our taxonomic understanding of swiftlets by showing that the type of nest built and the ability or inability to echolocate may be useful in judging affinities. This paper discusses the swiftlets of southeast Polynesia from Tahiti, Atiu and the Marquesas Islands. They are more similar to each other in morphology than any one of them is to forms occurring further west in the Pacific. Atiu (20° 00′ S, 158° 07′ W) is about 750 nautical miles WSW of Tahiti and Moorea (17° 40′ S, 149° 05′ W), and 1260 nautical miles southwest of the nearest of the Marquesas Islands (9° 23′ S, 140° 06′ W), whereas Tahiti is only about 630 miles southwest of the Marquesas.

Mayr (1937) pointed out that the swiftlets of Tahiti ('*C. l. leucophaea*') and the Marquesas Islands ('*C. l. ocista*') agree in being rather large and dull coloured, with little or no trace of the pale supraloral spots found in some related species. They also have rather long tails and a distinctive soft texture to the plumage, although the texture is difficult to detect in old museum skins. A swiftlet discovered on Atiu in the southern Cook Islands in 1973 and given the name *Collocalia sawtelli*, has similar features (Holyoak 1974a). These features set the swiftlets of southeast Polynesia somewhat apart from the rest of the genus, but they appear to be closer to those of *A. vanikorensis* than of other Melanesian species.

duPont (1976: 106) synonymized *sawtelli* with *leucophaea*, stating that it is "Morphologically indistinct (specimens examined) but alleged to differ from *C. l. leucocephala* (sic) by echo locating". However, he could only have seen one specimen of *sawtelli*, a paratype lodged at the British Museum (Natural History), while the only comparative material available there consists of two old and faded specimens of *A. leucophaeus*. The differences between *A. sawtelli* (8 specimens examined), *A. leucophaeus* (12 specimens) and *A. ocistus* (92 specimens) in morphology and nest structure are summarized below.

Morphology

Fully-grown birds of all populations of the *A. leucophaeus* group have predominantly blackish-brown upperparts with slightly paler underparts and a small light patch on the longer uppertail-coverts where light grey-brown feather bases are partly exposed. The pale patch is least conspicuous because the feather bases are darkest in birds from Tahiti and most conspicuous in those from Atiu, Marquesan birds being variable but usually intermediate. In fresh plumage there is a slight green gloss on the dark feathers of the upperparts and wing-coverts, but this disappears in old specimens, which become lighter and browner. Tahiti birds are lighter and browner than those from the Marquesas Islands, to judge from comparison of 50 year old skins of both, and the Marquesan specimens appear slightly lighter than three year old skins

from Atiu. The underparts of Atiu birds appear to be slightly but consistently lighter than in the other populations. To judge from museum skins, the feet and especially the claws have little dark pigmentation in Tahiti birds, more in Marquesan birds and most in Atiu birds.

TABLE I
Measurements (mm) of wing and tail length in Polynesian swiftlets. There is little if any sexual dimorphism in size.

	N	*X wing*	*X tail*	$\frac{X\ tail}{X\ wing} \times 100$
Atiu	8	118·1 (s=1·22)	54·6 (s=1·08)	46·6
Tahiti	10	126·1 (s=2·02)	57·4 (s=2·19)	45·5
Marquesas Is.:				
Eiao	6	119·1 (s=1·73)	61·4 (s=2·01)	51·5
Nuku Hiva	37	122·4 (s=1·89)	62·6 (s=1·16)	51·2
Ua Huka	12	121·6 (s=1·28)	60·5 (s=1·37)	49·8
Ua Pou	5	127·4 (s=1·56)	66·3 (s=1·92)	52·0
Hiva Oa	21	123·1 (s=1·41)	62·8 (s=1·89)	51·0
Tahuata	4	121·7 (s=2·01)	62·3 (s=1·17)	51·2

X=mean. s=standard deviation.

Table I gives measurements of wing and tail length in each of the Polynesian swiftlet populations. Wing-length was measured by flattening the wing and straightening the primaries, tail-length was measured from between the bases of the central pair of rectrices. Tahiti birds are rather large with a relatively short tail, Atiu birds are small with a short tail and Marquesan birds are variable in size, but mostly rather large, and have relatively long tails. These differences in proportions may be related to differences in feeding behaviour. The short-tailed swiftlets of Tahiti differ from the others in tending to feed mainly above the forest, although they sometimes descend to feed amongst the forest canopy. In contrast, Atiu and Marquesan swiftlets more often feed by flying slowly among the twigs and branches of the forest edge and canopy (Holyoak & Thibault, in prep), so their higher tail/wing ratio may confer greater manoeuvrability when feeding in this way. That the Tahiti swiftlet tends to feed higher than the other swiftlet species may be associated with the presence of *Hirundo tahitica* on Tahiti but not on the other islands. *H. tahitica* mainly feeds close to the forest canopy or edge or over water and it has a much longer tail than any of the swiftlets. Further, flycatchers which catch prey on the wing are absent from southeast Polynesia and this may be associated with the fact that most *Aerodramus* and the *Hirundo* of the region commonly feed very close to forest trees. Samoa and Fiji do have flycatchers which catch prey on the wing (e.g. *Myiagra* spp.) but the swiftlets there (*A. spodiopygius* subspp.) habitually feed at some height above the ground and rarely enter the forest edge or canopy, and the Fijian populations of *Hirundo tahitica* differ from the Tahiti population in infrequently feeding amongst the forest canopy or at the edge.

The structure of the bill varies between different swiftlet populations in southeast Polynesia. In Tahiti birds the maxilla is heavy with a short hook and it is not abruptly attenuated towards the tip. In Atiu birds it is weaker with a rather long hook and abrupt attenuation distally. Marquesan birds are intermediate between those of Atiu and Tahiti.

The Atiu swiftlet appears closer to the Marquesan swiftlets in coloration and various morphological features than it does to the Tahiti swiftlet, although it resembles the latter in having a relatively short tail.

Nests and nest sites

Unfortunately, very little information is available on the nests and nest sites of the Tahiti swiftlet. Wilson (1907) reported seeing nests on a rocky crag, and Quayle (MS., *in* Holyoak 1974b) saw nests made of moss in a shallow depression in a rocky crag. It is uncertain whether this Tahiti swiftlet, which is now considerably reduced in numbers, has the ability to echolocate, although echolocation would be unnecessary in the nest sites that have been described. The absence of native hawks and owls from southeast Polynesia may have allowed swiftlets there to nest more openly than the native hawks present on islands of the southwest Pacific would allow; and the introduction of the Indian Mynah *Acridotheres tristis* to the Society Islands and Hiva Oa might have been at least partly responsible for the decrease of swiftlets there.

Marquesan swiftlets nest in colonies of from two or three to a hundred or more nests in very varied sites. Some are in shallow depressions under overhanging rock crags or sea cliffs, others are in shallow caves and others are in deep caves. The more open sites receive full illumination, others are partly illuminated and some colonies in true caves receive no light at all. Holyoak (1974a) thought that Marquesan swiftlets do not echolocate, but recent studies have shown that in deep caves flying birds utter series of distinctive rattling clicks which are quite different from the calls used outside caves, and which almost certainly function in echolocation (cf. Griffin & Suthers 1970).

The nests of Marquesan swiftlets are substantial cup-shaped structures built mainly of pleurocarpous mosses collected from trees, sometimes with the addition of small amounts of lichen and fibres of higher plants (Fig. 1). The nest materials are cemented together with small quantities of sticky transparent saliva and the mossy cup often contains a variable number of swiftlet feathers. The nests are normally stuck to vertical or slightly overhanging rock, even though small ledges are often present close by.

The Atiu swiftlet nests only in deep caves in the uplifted coral limestone of the makatea region of the island. A colony visited in the Anataketake Cave in September 1973 contained *c.* 60 nests and local people reported that there were a few smaller colonies in similar caves elsewhere on the island. Some nests received a little light from the cave entrance, but most were in complete darkness. Distinctive rattling clicks were given continually by birds flying in dark parts of the cave, but these were not heard outside. There can be little doubt that these clicks function in echolocation.

The nests of Atiu swiftlets were found only on small ledges high up in the cave. They were shallow cup-shaped structures woven from plant fibres, lichens or both, that were cemented together with quantities of sticky transparent saliva (Fig. 2). Some of the 20 nests inspected were so flimsy

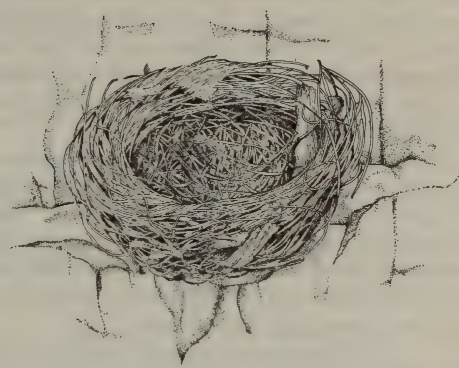

Figure 1 (Left). Nest of *Aerodramus* (*leucophaeus*) *ocistus* collected on Ua Pou, Marquesas Islands, October 1975; specimen in Brit. Mus. (Nat. Hist.). ½ natural size. Drawn by Mrs. Linda Whitehouse.

Figure 2 (Right). Nest of *Aerodramus* (*leucophaeus*) *sawtelli* collected on Atiu, southern Cook Islands, September 1973; specimen in Brit. Mus. (Nat. Hist.). ½ natural size. Drawn by Mrs. Linda Whitehouse.

that the egg rested on bare rock within the cup and in most nests there was only a thin layer of plant fibres beneath the egg. Moss and feathers were absent from all the nests inspected.

Eggs of the Atiu swiftlet are apparently smaller than those of Marquesan swiftlets in conformity with the smaller size of adult birds from Atiu. Four eggs from Atiu measure 17·4×12·6, 17·9 ×12·7, 18·1×12·6, and 18·0× 12·8 mm, whereas one from Nuku Hiva, Marquesas Islands measures 21·8×12·5 mm.

Taxonomy

It is difficult to decide on the best taxonomic treatment for the *Aerodramus* of southeast Polynesia. They are all rather similar in morphology and coloration, but the nests of at least Atiu and Marquesan birds differ considerably. Medway (1975) uses similarities of nest structure as an argument for treating various Melanesian swiftlet populations as subspecies of *A. vanikorensis*, on the grounds that similarities in nest structure reflect similarities in genetically controlled behaviour patterns and in the cement-producing salivary glands. The different nests built by Atiu and Marquesan swiftlets may correspondingly imply that there are genetical differences in nest-building behaviour, but there is no evidence for differences in the salivary glands.

Mayr (1937) had earlier argued that certain swiftlet populations of generally similar appearance to *A. vanikorensis* should be treated as separate species merely because nearly all the other landbirds having similarly wide geographical ranges in the western Pacific Ocean were divided into several species. However, in advocating the merging of these populations into one species Medway (1975) pointed out that *Halcyon chloris*, for example, has as wide a range itself as the enlarged *A. vanikorensis* group. On the other hand nearly all the widespread land bird genera occurring on Atiu, Tahiti and in the

Marquesas Islands are represented by separate species in these three archipelagos. *Halcyon* for example, is represented by *H. tuta* on Atiu, *H. venerata* and a very small population of *H. tuta* on Tahiti and *H. godeffroyi* in the Marquesas Islands. However, the usefulness of general faunistic arguments of this kind in deciding particular cases is uncertain and it can easily lead to circular reasoning.

Gene-flow between the isolated swiftlet populations of Atiu, Tahiti and the Marquesas Islands is probably extremely infrequent, so that the question of species' taxonomic limits among them seems an artificial problem; moreover, the occurrence of sympatry of any of these three forms is remotely improbable so that the question will anyway remain unanswerable.

The most useful classification may therefore be one which expresses the above uncertainty, as follows:

A. (*leucophaeus*) *sawtelli* (Holyoak) Southern Cook Islands: Atiu;

A. (*leucophaeus*) *leucophaeus* (Peale) Society Islands: Tahiti; the small swiftlet population on Moorea and those formerly in the Leeward Society Islands (Thibault 1974) were presumably of this form;

A. (*leucophaeus*) *ocistus* (Oberholser) Marquesas Islands: Eiao, Nuku Hiva, Ua Huka, Ua Pou, Hiva Oa, Tahuata, Mohotani.

The use of a specific epiphet placed in parentheses in this way was advocated 30 years ago by Kiriakoff (1948) for identifying closely related and often sympatric species, forming a group for which he coined the name 'ultra-species'. We prefer to restrict usage of such a system of brackets to closely related forms that represent each other geographically and with which the determination of species' taxonomic limits is little better than guesswork on present evidence.

Amadon (1966) advocated the use of a specific epiphet in square brackets to identify particular species as components of superspecies and a specific epiphet in parentheses to identify semispecies, which he defined as forms believed to be subspecies, 'but approaching, or possibly of, species status . . .'. Cain (1971) among others has pointed out the limitations and uncertainties inherent in the application of the superspecies concept and we do not wish to indicate that the three swiftlets listed above form a superspecies.

Treating all three Polynesian swiftlets in this way rather than as subspecies of *A. leucophaeus* should have the desirable effect of encouraging future workers to present biological information separately for each group of populations.

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References:

Amadon, D. 1966. The superspecies concept. *Syst. Zool.* 15: 245–249.

Brooke, R. K. 1972. Generic limits in old world Apodidae and Hirundinidae. *Bull. Brit. Orn. Cl.* 92: 52–57.

Cain, A. J. 1971. Special review of *An Atlas of Speciation of African Passerine Birds*, by Hall, B. P. & Moreau, R. E., 1970. *Ibis* 113: 379–380.
du Pont, J. 1976. South Pacific Birds. Delaware Mus. Nat. Hist., Monograph Ser. no. 3. Greeneville, Del.
Griffin, D. R. & Suthers, R. A. 1970. Sensitivity of echo location in cave swiftlets. *Biol. Bull.* 139: 495–501.
Holyoak, D. T. 1974a. Undescribed land birds from the Cook Islands, Pacific Ocean. *Bull. Brit. Orn. Cl.* 94: 145–150.
Holyoak, D. T. 1974b. Les oiseaux des iles de la Société. *Oiseau, R.F.O.* 44: 1–27, 153–184.
Holyoak, D. T. & Thibault, J. C. in prep. L'Avifaune de Polynésie orientale.
Kiriakoff, S. G. 1948. On the so-called 'lower' taxonomic categories. *Lepidopterist's News* 2: 3–4.
Mayr, E. 1937. Birds collected during the Whitney South Sea Expedition. XXXIII. Notes on New Guinea Birds I. *Amer. Mus. Novit.* 915: 1–19.
Medway, Lord 1966. Field characters as a guide to the specific relations of swiftlets. *Proc. Linn. Soc. London* 177: 151–172.
— 1975. The nest of *Collocalia v. vanikorensis* and taxonomic implications. *Emu* 75: 154–155.
Medway, Lord & Pye, J. D. 1977. Echolocation and systematics of swiftlets. *In*, B. Stonehouse & C. M. Perrins (eds.). *Evolutionary Ecology*. London: MacMillan.
Simms, R. W. 1961. The identification of Malaysian species of swiftlets *Collocalia. Ibis* 103a: 205–210.
Thibault, J.-C. 1974. Le peuplement avien des iles de la Société. *Mus. Nat. Hist. Nat. et Hautes Etudes*. Antenne de Tahiti, Papeete.
Wilson, S. B. 1907. Notes on birds of Tahiti and the Society Group. *Ibis* 9th ser. (3): 373–379.

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Bird skins from Malawi (formerly Nyasaland) in the Merseyside County Museums, Liverpool

by P. J. Morgan, C. W. Benson and F. M. Benson

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Benson & Benson (1977: 220–222), in notes on collections of bird specimens, in fact skins, from Malawi, give a total of *c.* 7,500 in the British Museum (Natural History) (BMNH) out of *c.* 16,000 in the world as a whole. They add that the only other museum in the United Kingdom holding any number of specimens is the University Museum of Zoology, Cambridge (UMZC), which obtained a share of a collection made by C. B. C. Storey in 1907, that is precisely 41 in the BMNH and 31 in the UMZC (Benson & Benson, *Arnoldia, Rhodesia* 7(32), 1975: 3).

As a result of an informal meeting of ornithologists with an African interest at the Merseyside County Museums, Liverpool (LIVCM) on 17 and 18 September 1977 ('The African Chat'), attended by all three of us, it became apparent that there was a very appreciable representation of material from Malawi in this museum, emanating from A. Whyte and Sir Alfred Sharpe. The Whyte material was included in Canon H. B. Tristram's first collection, purchased in 1896, while the Sharpe material was presented by Sir Alfred himself in 1903.

Whyte collected in Malawi in 1891–1897, under the patronage of Sir Harry Johnston, the first administrator of the territory (see also R. B. Sharpe 1906: 404, 511). His collections were reported on by G. E. Shelley in a series of papers (*Ibis*, 1893–1898). All the specimens traced in the LIVCM were collected in 1892–1893, at well known localities in southern Malawi, the majority at Zomba. They were obviously examined by Shelley, since they bear identifications in his handwriting, apart from a few in an unknown hand. Clearly they were too late for inclusion in Tristram's printed catalogue (1889). However, Tristram continued to maintain manuscript catalogues, four out of five of which are in the LIVCM. These have been analysed to produce a donor/collector index, cross-references to specimens, specimen numbers and collection dates. The records under Whyte's name reveal a total of 104 specimens, all bearing Tristram labels and numbers. In fact there are at least a further 152 specimens. These bear only original labels in Whyte's handwriting, and labels printed with Sir Harry Johnston's name endorsed with Shelley's determination. They must have been kept as 'duplicates' by Tristram, not for incorporation into his collection, although they were included in the sale to the LIVCM some three years after their receipt.

Particularly notable are the following specimens, all apparently adult, which, although not actually type material (in the BMNH, cf. Warren 1966, Warren & Harrison 1971), were collected at about the same time:—

Aplopelia larvata johnstoni Shelley (*Ibis*, 1893: 28), now considered a synonym of *A. l. larvata*: one, undated, Milanji (Mulanje).

Lybius torquatus zombae (Shelley, *Ibis*, 1893: 10): one, Nov. 1892, Zomba.

Buccanodon whytii whytii (Shelley, *Ibis*, 1893: 11): one, Nov. 1892, Zomba.

Andropadus tephrolaema fusciceps (Shelley, *Ibis*, 1893: 13): one, Sept. 1892, Milanji (Mulanje).

Phyllastrephus cerviniventris Shelley (*Ibis*, 1894: 10): two, July 1892, one, Aug. 1892, Zomba. The July specimens appear to be the first ever collected, although not mentioned by Shelley in his description.

Pogonocichla stellata johnstoni Shelley (*Ibis*, 1893: 18), now considered a synonym of *P. s. orientalis*: one, Sept. 1892, Milanji (Mulanje).

Anthreptes longuemarei nyassae Neumann (*Orn. Monatsber.* 14, 1906: 7): one, 6 Jan. 1893, Zomba. Male in full metallic breeding dress. The distinctiveness of this form was overlooked by Shelley (*Ibis*, 1893: 17; 1894: 14; 1898: 379). The holotype was collected as late as 27 July 1897.

One specimen of *Sylvietta whytii whytii* Shelley (*Ibis*, 1894: 13) is listed by Tristram as collected in August 1892. It would appear to be a syntype, but unfortunately has not been located. It seems that, in addition to the *Phylloscopus* spp. and Zosteropidae lost in the bombing of the museum in 1941 (Wagstaffe in press), the majority of the African Sylviinae were also destroyed. Another Whyte specimen of interest is an apparent male of *Batis soror* (not *molitor*), November 1892, Zomba: wing 58, tail 39 mm, cf. Benson & Benson (1977: 241).

Sir Alfred Sharpe succeeded Sir Harry Johnston (R. B. Sharpe 1906: 476), and collecting continued in his name. It is C.W.B.'s understanding that this was left to barely literate Africans, as is suggested by the handwriting on the original labels, the same as that on some Sharpe specimens in the BMNH. Shelley continued his series of reports, the final one being in *Ibis*, 1901: 586–595, dealing with specimens collected from October 1900 to

January 1901. The 159 in the LIVCM bear months and years of collecting, April 1901 to February 1902, and Shelley's determinations, although it seems that he did not consider that publication of a further report was warranted. Collecting localities (with the suffix 'B.C.A.', British Central Africa, the name Nyasaland not being officially recognised until 1907) are:—Buwa (Bua River), Chanda, Chilasulo (Chiradzulu), Chilwa, Malosa, Matiya, Mpimbe, Namiwawa, Palombe (Phalombe), S(outh) Angoniland, Ulumba, Zomba. All these names are in the gazetteer of localities in Benson & Benson (1977), except Matiya and Ulumba, whose locus is uncertain. The remainder are all in southern or central Malawi, the most northerly being the Bua River. Worth mention are a specimen of *Anthus vaalensis* from South Angoniland, September 1901, and one of *A. leucophrys* therefrom, August 1901. There is also a series of seven specimens, from Chiradzulu, Chanda, South Angoniland and marked 'Lamprocolius sycobius' (=*Lamprotornis chalybaeus sycobius*), but in fact the smaller *L. chloropterus elizabeth*, since they have a wing range of 111–120 mm only.

A perusal of the catalogue of Forbes & Robinson (1898–1901), covering only non-passerines, indicates the inclusion of a number of Whyte's specimens, although his name is not mentioned. The dates and localities—Zomba, Upper Shire, Tshiromo (Chiromo), Milanji (Mulanje), Lake Shirwa (Chilwa)—tally accordingly. Sharpe's material does not appear in the museum register until February 1903, and was too late for inclusion. However (pp. 35 *et seq.*), Forbes & Robinson mention a locality 'Central Africa (Kikombo)'. Prior to 1901 Sharpe did receive specimens from 'Kikomba (Ikomba)' (sic), in present day northeastern Zambia at 9° 09′ S, 32° 15′ E (Benson, *Bull. Brit. Orn. Cl.* 67, 1946: 37; Benson & Benson 1977: 233). This is not to be confused with Kikombo, in central Tanzania at 6° 15′ S, 36° 00′ E, *c.* 40 km east-southeast of Dodoma (*Times Atlas of the world*, 1975). In the LIVCM there is a collection from Kikombo made by Dr. S. T. Pruen in 1888, received through Canon Tristram in 1896. Many of these specimens are listed by Tristram (1889, including Addenda). One of them in particular is remotely unlikely to ever occur in northeastern Zambia (nor indeed Malawi), *Cosmopsarus unicolor*, listed on p. 253. The misunderstandings which can arise over African collecting localities is alluded to by Benson & Benson (1977: 223–224). One further instance is the type-locality 'Myombe, northern Nyasaland' for *Serinus madarszi* (cf. Peters's *Checklist of Birds of the World* 14, 1968: 220), which should read 'Muyombe, north-eastern Zambia', Muyombe being at 10° 40′ S, 33° 30′ E (Benson *et al.*, *Birds of Zambia*, 1971: 381).

To conclude, while Benson & Benson (1977: 220) were aware that some 600 specimens from these early Malawi collections were transferred to the South Africa Museum, Cape Town, it was only in September 1977 that this important holding in Liverpool came to their notice. It totals at least 415 specimens (including a precise figure from Sharpe of 159), representing 125 species. Apart from those already mentioned, certain common species are well represented, mostly by Whyte material, thus:—*Turdoides jardineii*, 18 specimens; *Turdus libonyanus* and *Tchagra senegala*, 23 each; *Euplectes capensis*, 20. In the case of the last, all from Whyte, some specimens have surely been misdated. There are six males in breeding dress dated July or August, but this dress is only known to be worn from about December to May (Benson & Benson 1977: 194).

Sincere thanks are due to Michael Brennan, of the Merseyside County Museums, who produced the index of the Tristram collection, while employed under the Manpower Services Commission Job Creation Programme.

References:

Benson, C. W. & Benson, F. M. 1977. *The Birds of Malawi*. Limbe: D. W. K. Macpherson (sponsor).

Forbes, H. O. & Robinson, H. C. 1898–1901. Catalogues of birds in the Derby Museum, Liverpool. *Bull. Liverpool Mus.* 1–3.

Sharpe, R. B. 1906. *The History of the Collections in the Natural History Departments of the British Museum. Birds*. London: Trustees of the British Museum.

Tristram, H. B. 1889. *Catalogue of a Collection of Birds*. Durham: author.

Wagstaffe, R. in press. *Avian types in Merseyside County Museums (formerly City of Liverpool Museums)*. Liverpool: Merseyside County Museums.

Warren, R. L. M. 1966. *Type-specimens of Birds in the British Museum (Natural History) 1. Non-passerines*. London: Trustees of the British Museum (Natural History).

Warren, R. L. M. & Harrison, C. J. O. 1971. *Type-specimens of Birds in the British Museum (Natural History) 2. Passerines*. London: Trustees of the British Museum (Natural History).

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The Basisphenoid notch of Kingfishers

by P. J. K. Burton

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The basisphenoid rostrum is a structure of vital importance in a bird's skull. From the base of the cranium, this bony bar runs forward along the midline, forming the ventral edge of the interorbital septum. It plays a crucial part in cranial kinesis (the process by which the upper jaw is raised or lowered relative to the cranium), providing a firm bony rail on which the palatines and pterygoids may slide backwards or forwards. A full discussion of this mechanism is provided by Bock (1964). This short paper draws attention to an unusual modification of the basisphenoid rostrum in kingfishers (Alcedinidae) observed in the course of a study of feeding apparatus structure in the Coraciiformes and Piciformes (Burton, in prep.). Though a striking feature of many kingfisher skulls, it seems to have been generally overlooked, even in such studies as those of Shufeldt (1884) and Verheyen (1955). Because the rostrum plays so fundamental a part in kinesis, the presence of this modification immediately raises the question of whether some equally unusual kinetic mechanism is involved. This question, and other possible functional interpretations, are considered in the discussion.

Description

This feature was first noticed in skulls of *Ceryle* and *Chloroceryle* spp. (Alcedinidae: Cerylinae), and has subsequently been found in various other Alcedinidae. Possible functional equivalents in birds of other orders will be considered in the discussion.

The feature will be termed the *basisphenoid notch*. It consists, quite simply, of a deep and roughly semicircular emargination of the basisphenoid rostrum, just posterior to the midpoint of the orbit, and immediately below the main fenestra in the interorbital septum (Fig. 1). The rostrum itself has

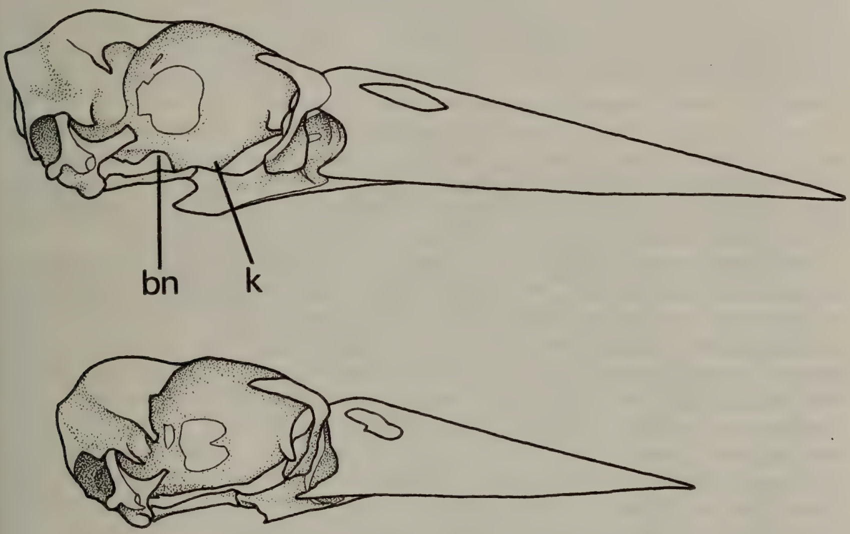

Figure 1. Upper: skull of *Pelargopsis amauroptera*, to show basisphenoid notch (bn) and keel (k). Upper jaw and palate in protracted position.

Lower: skull of *Dacelo gaudichaud*, a species lacking the notch. Drawn with palatines and pterygoids held away from the rostrum to show its profile clearly.

The jugal bar has been omitted from both drawings for clarity. Both natural size.

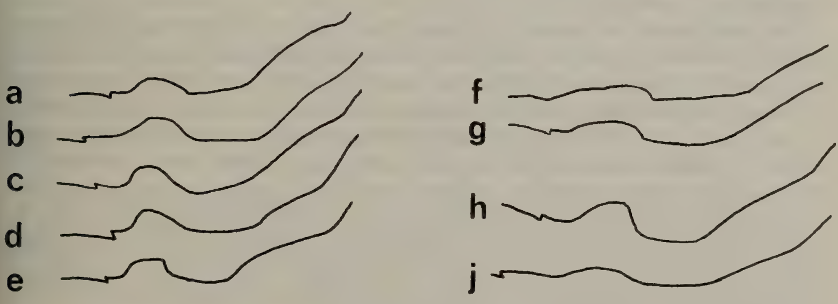

Figure 2. Profile of the basisphenoid rostrum in various kingfishers possessing a basisphenoid notch. As the keel cannot normally be fully exposed without damage to the specimen, its shape as shown is partly an estimate. Not to scale. Right hand end of profile is anterior.

a—*Ceryle alcyon*; b—*C. maxima*; c—*C. rudis*; d—*Chloroceryle amazona*; e—*C. inda*; f—*Alcedo atthis*; g—*Ceyx erithacus*; h—*Pelargopsis amauroptera*; j—*Halcyon smyrnensis*.

a distinctive form in kingfishers, with a roughly T-shaped cross section. The stem of the T is the rostrum proper—a thin flange of bone along the extreme ventral edge of the interorbital septum on which the palatines slide. Above it, the bone broadens on either side, as a thickened rim just dorsal to the palatines and pterygoids. The notch is confined to the narrow flange, and does not intrude into the thickened rim above it. Anterior to the notch, the rostrum curves downward, then up again towards the front of the orbit, as a roughly keel-shaped plate of bone. In most dried skulls, the junction of pterygoid and palatine lies just anterior to the notch and there is strong connective tissue attachment between this junction and the keel (or the rostrum in unmodified species). Examination of spirit specimens shows that with the upper jaw in resting position, the notch lies dorsal to the infundibular slit and the chamber (antrum tubarum) into which the Eustachian tubes open. Connective tissue attached to the rear end of this chamber arises at the posterior edge of the notch, and can be seen in dorsal view.

The notch varies considerably in its form and depth among the Alcedinidae, and is, indeed, absent in many. Fig. 2 shows the range of variation, which occurs within, as well as between species. It is present, and strongly developed throughout the Cerylinae,* while among the Alcedininae it is present in most species, though shallower and relatively longer. Members of the Alcedininae found to lack it were *Ceyx lepidus* and *Ispidina picta*. The Daceloninae present a different picture, for it is absent (or indicated by only the slightest concavity) in the majority of species. A striking exception is *Pelargopsis*, in which both the notch and the keel anterior to it are better developed even than in the Cerylinae. A well developed notch is also present in *Halcyon smyrnensis*, and a shallow one in *H. pileata*, *H. coromanda*, *H. leucocephala* and *H. chelicuti*.

It should be commented at this point, that when considering possible kinetic effects, the keel anterior to the notch is the important feature, rather than the notch itself. However, the notch is more than simply the end of the keel, since its rear border curves down again posteriorly.

Manipulation experiments

If a bird's skull is soaked in water for a time, it becomes sufficiently pliable to allow the upper jaw and kinetic apparatus to move once again, approximating their movements in life. In a kingfisher's skull possessing the basisphenoid notch, the fully retracted position may be reached simply by pushing the tip of the upper jaw downwards until it stops; movement is halted by contact between the upper part of the lateral nasal bar and the lacrimal. The pterygo-palatine junction now lies roughly in the deepest part of the notch, while the keel-shaped region of the basisphenoid anterior to the notch fits into the median trough between the upturned medial flanges of right and left palatines. In a skull of *Pelargopsis amauroptera* it was found that retraction could proceed further, until the pterygo-palatine junction was in contact with the posterior edge of the notch.

Even more useful information can be obtained if a fresh specimen is available, since the presence of muscles, ligaments and connective tissue

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*Only *Ceryle lugubris* was unavailable for examination, but there is little reason to suspect that it would differ from the rest of the subfamily.

creates a situation much closer to that in life. The only fresh specimen currently available has been one of *Alcedo atthis*, in which the notch is relatively shallow, as in other Alcedininae. The results of manipulating this specimen agree well with those obtained with skulls, but an interesting effect is noted if protraction is brought about by upward pressure on the quadrate, via the posterior end of the mandible. At first, there is considerable resistance to this pressure; the palatines move forward slowly, and the upper jaw is raised slowly. Quite suddenly, the resistance disappears, accompanied by a tangible click, the palatine shoots forward, and the upper jaw is rapidly and strongly elevated.

Discussion

Before considering possible functions of the notch, it is necessary to summarise some characteristic features of cranial anatomy in kingfishers; a much fuller account will appear in a forthcoming paper (Burton, in prep.).

Compared with other Coraciiform skulls, those of kingfishers show various modifications tending towards the '*streckschadel*' (stretched skull) form described by Barnikol (1952), though much less extreme than in the examples he chose, such as *Cygnus* and *Phalacrocorax*. These modifications include long pterygoids, subtending a markedly smaller angle posteriorly than in most birds, while the quadrates are sited well posterior to the orbit. Perhaps in consequence of the quadrate position, many kingfishers lack M. pseudotemporalis profundus, an adduction/retraction muscle running between the quadrate and the mandible. Attachment of a part of M. pterygoideus on the maxillo-palatines is another unusual feature seen in many kingfishers, though also found in several other Coraciiform and Piciform families. However, neither this feature, nor loss of M. pseudotemporalis profundus, is correlated with presence of the basisphenoid notch.

Kingfishers of the subfamilies Cerylinae and Alcedininae have the postorbital ligament much reduced or in some cases apparently absent. It is generally better developed in the Daceloninae, including *Pelargopsis*. This may be of some significance when considering possible kinetic functions of the notch, since the postorbital ligament is the chief means by which kinetic coupling (linked action of upper and lower jaws) is achieved. Poor development of the ligament suggests that many kingfishers rely largely on uncoupled kinesis (see Bock (1964) for discussion of these mechanisms). This is less suited for rapid actions, but increases the ability to manipulate prey with precision—probably an advantage when handling fish.

Some functional properties of the notch may now be considered:

1. In *Chloroceryle amazona* and *Pelargopsis amauroptera*, the shape of the notch appreciably affects the movements of the palatines, pterygoids and quadrates. As retraction proceeds towards its limits, the pterygo-palatine junction rises upwards. Compared with the normal condition this will somewhat reduce postero-lateral movement by the pterygoids and quadrates. Thus, the notch may somewhat extend the range of retraction possible, or at least fill a safety function during extreme retraction.

However, this is unlikely to be a universal function. Manipulation of most other kingfisher skulls shows that the pterygo-palatine junction only enters the notch in the extreme retracted position, and shows no tendency

to rise at this stage—if anything rather the reverse. The movements of pterygoid and palatine are in this case determined only by the form of the keel anterior to the notch.

2. Species in which the palatines and pterygoids can rise into the notch would possess a possible further advantage, as this would appreciably increase the lumen of the buccal cavity—a potentially valuable action when swallowing large fish. Again, however, this capacity seems to be of limited occurrence.

3. The effect observed when manipulating a fresh specimen of *Alcedo atthis* is of interest, though strictly related more to the form of the basisphenoid keel, rather than the notch itself. Pressure on the quadrate, via the mandible, roughly duplicates the action of M. protractor during upper jaw elevation. The sudden reduction of resistance accompanied by rapid protractions appears to occur when the quadrates pass a threshold point in their rocking movement on the otic articulation. Before this point is reached, they are tending to force the palatines firmly against the basisphenoid rostrum; beyond it, they tend to force them away, and movement suddenly proceeds much more freely. However, although this effect could probably be reproduced in life, it is far from clear what biological role it would serve. Though rapid jaw closure can be useful to birds capturing active prey (see, e.g. Bock & Morony 1972), rapid opening seems much less useful, particularly in kingfishers, which normally strike the water surface with bills already open.

4. A possibility which has to be considered is that the notch acts to lock the upper jaw in a retracted position. From an initial examination, this seems an attractive idea; it would seem that the pterygo-palatine junction might be locked into the notch by upward force, and released by a downward one. Beecher (1953)* suggested that a retraction lock would permit a bird to 'maintain a grip indefinitely with decreased muscular effort', and this would certainly be an advantage for kingfishers, which may have to grip their slippery and awkward prey for a considerable time, especially when feeding young. Nevertheless, I doubt if the basisphenoid notch works in this way for the following reasons:

a. The only muscle which could raise the palatines and pterygoids relative to the cranium is M. protractor. However, its force, transmitted via the pterygoids, has a large forward component capable of moving the kinetic apparatus anteriorly even from the deepest part of the notch.

b. I doubt the advantages of a retractor lock suggested by Beecher. Locking the upper jaw would merely suspend the normal two jaw action of birds in favour of a single jaw action as in mammals. The lock cannot put force into the system, and the reduced retraction effort would be offset by the need for stronger adduction to maintain grip. The only possible advantage might be to stabilize the advantageous jaw configuration attained during strong retraction, and perhaps even permit it to be maintained while the

*Beecher is referring to the Vanga shrike *Schetba rufa*. My own examination of this species fails to confirm his description of an ectethmoid/jugal locking device.

lower jaw is depressed. This might be of value when handling or swallowing prey, but it has yet to be demonstrated that anything of the kind actually occurs.

5. In species possessing the notch, the upturned medial edges of the palatines are relatively deeper than in those without it. This enables them to clasp the keel very firmly, providing increased resistance to lateral deflection. Possibly this provides protection against forces occurring while swallowing large fish, though in some fish eaters, e.g. *Phalacrocorax*, the palatines do not clasp the rostrum at all. However it would seem possible to evolve palatines with deeper medial edges even in the absence of a keel, and this factor certainly provides no explanation for the notch itself.

6. The close anatomical relationship between the basisphenoid notch and the antrum tubarum suggests some possible functional involvement with the Eustachian tubes. What the nature of this might be is unknown. Reduction or occlusion of the external nares is a feature of some diving birds (see, e.g. Macdonald 1960), but I know of no reported modifications concerning the Eustachian tubes. Kingfishers enter the water with bills open when they dive, and would be unable to equalise pressure changes on the middle ear cavity by altering the volume of the buccal cavity; possibly a small reservoir of air in the antrum tubarum could in some way be used for this purpose. Alternatively, some special modification may have arisen in connection with the process of swallowing large fish, when prolonged closure of the infundibular slit may be necessary. Unfortunately, too little is known at present about the functioning of the infundibular slit and Eustachian tubes in life to arrive at any clear conclusions. A brief account of buccal cavity structure and deglutition is given by Ziswiler & Farner (1972).

To recapitulate and comment so far: the basisphenoid notch is apparently capable of influencing kinetic movements in a few species, and this may be of some selective value. However, it does not seem to work this way in all cases, and I suspect that its primary functions are not related to kinesis. A connection with Eustachian tube functioning is a possible alternative deserving investigation.

The distribution of the basisphenoid notch among the three well marked subfamilies of kingfishers is also of evolutionary interest. This distribution may have arisen in one of two ways:

(a) The basisphenoid notch may be a feature which arose in the stock ancestral to all three subfamilies, but has been secondarily lost by many.

(b) It may have arisen independently in several lines in response to similar needs.

I tend to favour the second alternative, since the notch seems to be essentially a feature of the more highly specialised fish eaters, rather than of more primitive forms. If this is correct, it implies some genetic potential for evolving the notch which is common to all kingfishers. Situations of this type have been discussed by Bock (1963).

The possible occurrence of similar modifications in other groups of birds needs to be examined. No notch, or anything like it, is present in other families of Coraciiformes or Piciformes—two orders I have examined thoroughly in the course of other studies. It can also be assumed to be absent in all groups possessing basipterygoid processes, since these arise from the basisphenoid rostrum close to the position that a notch would occupy. I have examined a wide range of other birds, concentrating on fish eaters and birds of prey, but the only possible equivalent seems to be in frigate birds (Pelecaniformes; Fregatidae), which have the basisphenoid rostrum 'stepped' upwards a little way posterior to the pterygo-palatine articulation. Some other Pelecaniformes (Phäethontidae, Sulidae) have an upward slope in the posterior part of the basisphenoid rostrum, but nothing of such an abrupt nature as in the Fregatidae. (The Pelecanidae have a keel-shaped rostrum, but so sharply angled that if the palatines ever moved behind it, they would surely be inextricably jammed.)

Finally, it must be remarked that the discovery of the basisphenoid notch highlights the fact that the basisphenoid rostrum has been badly neglected in many studies of the avian skull, despite the attention that has been paid to the basipterygoid processes. Its crucial role in kinesis deserves a thorough and wide ranging study of its morphology and functions.

Species of kingfishers examined.

Skulls: *Ceryle maxima*, *C. alcyon*, *C. rudis*, *Chloroceryle amazona*, *C. americana*, *C. inda*, *Alcedo atthis*, *A. meninting*, *A. cristata*, *Ispidina picta*, *Ceyx lepidus*, *C. azureus*, *C. rufidorsum*, *Pelargopsis amauroptera*, *P. capensis*, *Dacelo novaeguineae*, *D. leachii*, *D. gaudichaud*, *Cittura cyanotis*, *Halcyon smyrnensis*, *H. senegalensis*, *H. macleayii*, *H. pyrrhopygia*, *H. sancta*, *H. chloris*, *H. concreta*.

Spirit specimens of: *Ceryle torquata*, *Chloroceryle inda*, *C. aenea*, *Alcedo atthis*, *Pelargopsis capensis*, *Clytoceyx rex*, *Melidora macrorrhina*, *Halcyon coromanda*, *H. pileata*, *H. leucocephala*, *H. chelicuti*, *Tanysiptera galatea*.
Fresh material: *Alcedo atthis*.

References:

Barnikol, A. 1952. Korrelationen in der Ausgestaltung der Schädelform bei Vögeln. *Gegenbaurs morph. Jb.* 92: 373–414.

Beecher, W. J. 1953. A phylogeny of the oscines. *Auk* 70: 270–333.

Bock, W. J. 1963. Evolution and phylogeny in morphologically uniform groups. *Am. Nat.* 97: 265–285.

— 1964. Kinetics of the avian skull. *J. Morphol.* 114: 1–42.

— & Morony, J. J. 1972. Snap-closing jaw ligaments in flycatchers. *Am. Zool.* 12: 729–730.

Burton, P. J. K. In preparation: Anatomy and evolution of the feeding apparatus in the Coraciiformes and Piciformes. *Bull. Br. Mus. Nat. Hist.*

Macdonald, J. D. 1960. Secondary external nares of the Gannet. *Proc. Zool. Soc. Lond.* 135: 357–363.

Shufeldt, R. W. 1884. Osteology of *Ceryle alcyon*. *J. Ant. Physiol. Lond.* 18: 279–294.

Verheyen, R. 1955. Analyse du potentiel morphologique et considérations sur la systématique des Coraciiformes (Wetmore 1934) (suite). *Bull. Inst. Sci. Nat. Belg.* 31 (93): 1–19.

Ziswiler, V. & Farner, D. S. 1972. Digestion and the digestive system. *In* Farner, D. S. & King, J. R. (Eds.): *Avian Biology*, Vol. II, 343–430. New York and London: Academic Press.

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Edited by

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FORTHCOMING MEETINGS

Tuesday 21 November 1978 at 6.30 p.m., jointly with the B.O.U. at Imperial College, Mr. E. M. Nicholson, C.B., on *The Role of British Ornithologists in Europe* and Mr. G. Mountfort, O.B.E., on *Ornithology in south-east Asia*. Cost including buffet supper—£3 per person.

A slip with details will be included with the October number of *Ibis* and those wishing to attend should send their slip together with cheque and s.a.e. to the B.O.U. (*NOT to the Club*) in accordance with the instructions on the slip.

Tuesday 5 December 1978 at 6.30 p.m. for 7 p.m. at the Goat Tavern, 3 Stafford Street, London, W.1. Mr. J. L. F. Parslow on *The function of the R.S.P.B. in British Ornithology*. Those wishing to attend should send a cheque for £2.70 a person together with their acceptance on the enclosed slip to Mrs. Diana Bradley, 53 Osterley Road, Isleworth, Middlesex to arrive not later than first post on Friday 2 December.

Tuesday 9 January 1979 at 6.30 p.m. for 7 p.m. at the Senior Common Room, South Side, Imperial College (entrance on the south side of Prince's Gardens, S.W.7, off Exhibition Road), Mr. J. H. R. Boswall on *Mutual mimics, men as birds and birds as men—an ornithological frolic*. Those wishing to attend should send a cheque for £3.80 a person together with their acceptance on the enclosed slip to Mrs. Diana Bradley, 53 Osterley Road, Isleworth, Middlesex, to arrive not later than first post on Thursday 4 January 1979.

Tuesday 6 March 1979 at 6.30 p.m. for 7 p.m., Mr. J. D. England, O.B.E. on *The birds of the Seychelles group of islands*.

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Addenda to minutes of Annual General Meeting (omitted in error), *Bull. Brit. Orn. Cl.* 98: 33.

The Minutes of the eighty-fifth Annual General Meeting (*Bull. Brit. Orn. Cl.* 97: 33 & xx) were approved and signed.

The seven hundred and thirteenth Meeting of the Club was held at the Goat Tavern, 3 Stafford Street, London, W.1. on Monday 17 July 1978 at 7 p.m.

Chairman: Dr. G. Beven; present 20 members and 9 guests. Mr. M. W. Woodcock spoke on *The Birds of Oman.*

Resume of talk 'The Birds of Oman'

Mr. Martin Woodcock spoke on the Birds of Oman, and following some introductory remarks, illustrated his talk with slides taken on his two recent extensive field trips.

He drew attention to the marked dichotomy in relationships shown by the avifauna on either side of the belt of desert across Oman around 20° N. The breeding birds of vegetated areas in the north and around Muscat are almost entirely of Indian affinity, the common species including Indian Roller *Coracias benghalensis*, House Crow *Corvus splendens*, Grey Francolin *Francolinus pondicerianus*, Purple Sunbird *Nectarinia asiatica*, Red-wattled Plover *Vanellus indicus* and Yellow-throated Sparrow *Petronia xanthocollis*. The House Crow appears identical with the pale race *zugmayeri* of Pakistan, and the House Sparrow, which is also common, seems to be of the race *indicus* which occurs throughout India.

In the south of Oman, the Dhofar, on the other hand, the Ethiopian influence is predominant, with such species as Ruppell's Weaver *Ploceus galbula*, Blackstart *Cercomela melanura*, Cinnamon-breasted Rock Bunting *Emberiza tahapisi*, Paradise Flycatcher *Terpsiphone viridis*, Grey-headed Kingfisher *Halcyon leucocephala* and Bruce's Green Pigeon *Treron waalia.*

The status of the Silverbill *Euodice malabarica* is of particular interest. In the north the birds resemble the nominate race of India, while in the Dhofar they have a black rump, characteristic of the African races of this bird, which Voous (*Ibis* 119: 386) has recently treated as specifically distinct from the Indian race. This seems to underline rather neatly the dual character of the avifauna in Oman, and the importance of the desert barrier.

XIX Century Indian Ocean seabirds eggs in the South African Museum

by R. K. Brooke

Received 10 January 1978

Layard (1867a) mentioned that some eggs from the Crozet Islands had come into his hands at the South African Museum, Cape Town, and Brooke (1976) added that Layard had collected material on Indian Ocean islands while travelling on the survey ship H.M.S. *Castor* in 1856/7. Nearly all the eggs Layard mentioned survive, as well as a number of others from the Crozets, and some of his Indian Ocean islands eggs. Through the courtesy of Dr. T. H. Barry, Director of the South African Museum, I have examined the eggs collected in the last century and find that they provide new or confirmatory data. The reliability of the identification of some species where the

specimens have since disappeared, as in some cases here, can be supported by a consideration of the characters, particularly mensural, of the surviving eggs. I have particularly relied on the egg mensural data in Serventy *et al.* (1971) and Watson (1975). Layard measured his eggs in inches and lines, i.e. twelfths of an inch. Conversion to mm at the rate of 25·4 mm to the inch gives results close to those I obtained by measurement but not so close that I can confidently say which eggs Layard had measured when he wrote his 1867 paper.

Crozet Islands

Layard (1867a) states that his material from the Crozet Islands was brought by Captain Armson. Since the South African Museum holds or held far more material than Layard (1867a) mentioned, more than one journey must have been involved. I find from an examination of the *Cape of Good Hope Government Gazette* shipping notices that the first journey made by Capt. T. Armson was in the three masted schooner *Guadalquivir* of 112 tons which left Table Bay Harbour, Cape Town, on 30 October 1866 and returned with a crew of 12 fishermen and a cargo of oil, penguin?, on 8 June 1867. His second journey was made in the 135 ton schooner *Lifley* with 14 fishermen leaving Cape Town on 30 November 1867 and returning on 13 June 1868 with a cargo of oil. The next year the *Lifley* was commanded by Capt. R. Jeary who returned on 25 May 1869 with the cargo of *Eudyptes* penguin oil discussed by Layard (1869: 378). We may confidently hold that the material Layard (1867a) reported was obtained on the first journey and the balance in the South African Museum on the second.

Despin *et al.* (1972) provide detailed modern data on the ornithology of the Crozets against which the material collected by Capt. Armson can be assessed, material which was virtually the first from the Crozets to come into scientific hands. Despin *et al.* (1972) often note that Layard did not specify which island his skins and eggs came from. It appears from Watson (1975: 295) that at least both large islands of the group, Possession and East, were visited since eggs of *Pachyptila salvini*, restricted to Possession Island, and of *Halobaena caerulea*, restricted to East Island, were obtained. In any case nobody in the 1860s thought it very important to specify exactly which member of a group of remote islands a particular specimen came from, particularly when it might betray an exploitable source to a competitor.

Aptenodytes patagonicus: of the eggs mentioned by Layard (1867a: 459) 3 survive and measure 110·0 × 77·1, 108·8 × 75·3 and 106·4 × 73·2 mm.

Pygoscelis papua: according to Trimen's MS catalogue in the South African Museum (see Brooke 1976), there was once a specimen from the Crozets but I find no evidence that eggs ever reached Cape Town.

Eudyptes chrysocome: 3 eggs measure 77·0 × 57·8, 74·6 × 52·2 and 71·0 × 55·0 mm. It may be that Layard was told that they all came from one bird (1867a: 460) and that he was rightly sceptical of this story.

Eudyptes chrysolophus: 3 eggs measure 84·8 × 61·5, 83·4 × 63·9 and 79·6 × 63·0 mm and belong to this species which Layard (1867a: 460) inadequately distinguished from the preceeding. Layard (1869: 378) pointed out that one cargo of penguin oil required the slaughter of 51,800 *Eudyptes* penguins in the Crozets. Their present abundance on East Island in the Crozets, *c.* 150,000 birds (Despin *et al.* 1972), shows that penguin populations

can recover from slaughter when the rest of their environment is untroubled.

Diomedea exulans: one egg measures 135·2 × 81·8 mm: Layard (1867a: 460, 1867b: 363) had several eggs from the Crozets.

Phoebetria fusca/palpebrata: both forms breed on the Crozets (Despin *et al.* 1972) but Layard, like other workers of that period, did not realise that 2 species were involved and treated them as one sub nom. *P. fuliginosa* (1867a: 458). Berruti (1977) has shown that there is a significant difference in the breadths of the eggs of these species: for *P. fusca* he gives 96·0–110·7 × 59·3–68·7, av. (67) 103·0 × 65·1 mm and for *P. palpebrata* he gives 98·3–106·4 × 62·7–70·0, av. (17) 102·3 × 66·7. The last century eggs fall into two groups: one, of 2 eggs, is labelled *Diomedea chlororhynchos* (see Layard 1869: 377), though they do not resemble those of any mollymawk and are indistinguishable in shape and pattern from those of *Phoebetria* eggs: measuring 105·3 × 70·9 and 104·9 × 70·0. In view of Berruti's data on the comparative breadth of *Phoebetria* eggs, these eggs are unequivocally those of *P. palpebrata.* This should put to final rest the belief originating from Layard (1869) that *D. chlororhynchos* breeds on the Crozets. The remaining 3 eggs of this genus are not referable to species since they measure 105·8 × 65·7, 105·1 × 65·5 and 99·4 × 66·9 mm. They fit closer with the measurements of *P. fusca,* which is nowadays the commoner species there (Despin *et al.* 1972) and are probably referable to that species. All save one egg came from the second journey.

Macronectes giganteus/halli: both species breed on the Crozets (Despin *et al.* 1972) and nobody has yet distinguished their eggs, not even by a significant difference in an average (Voisin 1976). The eggs measure 109·4 × 68·0 and 105·4 × 69·1 mm, came from both journeys and either might belong to either species.

Pterodroma brevirostris: 4 unidentified eggs from the Crozets, measuring 58·6 × 42·5, 57·9 × 43·1, 56·8 × 43·6 and 55·4 × 41·8 mm, appear all to be of the same species. One carries an MS identification 'Blue Aiglette'. Since Capt. Armson and his sailors who brought the material to Cape Town called the dark brown *Phoebetria* spp. 'Blue Birds', I take Blue Aiglette to refer to the dark brown species *Pterodroma brevirostris*, rather than to the blue-grey and white *P. mollis* which lays the same sized egg (Serventy *et al.* 1971, Watson 1975: the former gives 55–60 × 44–47 mm for *P. brevirostris* and 58–59 × 42–43 for 3 eggs of *P. mollis*). Also Despin *et al.* (1972) found *P. brevirostris* to be a commoner breeding species than *P. mollis.*

Pterodroma macroptera: the one egg measures 66·2 × 48·2 mm: Layard (1867a: 460) only mentioned skins of adults and nestlings so the egg comes from the second journey.

Pachyptila salvini: Despin *et al.* (1972: 48) thought that Layard's (1867a: 460) reference to *P. banksi* as a breeding species in the Crozets was an error for *P. salvini.* They are correct. The eggs attributed to *P. banksi* (and *P. turtur* in MS) measure 53·4 × 36·3, 51·4 × 35·6 and 51·3 × 37·8 mm which places them among the larger eggs of *P. salvini* from the Crozets (Despin *et al.* 1972: Tab. XVIII).

Halobaena caerulea: an unidentified egg measuring 51·7 × 38·5 and inscribed in MS 'Small Mutton Bird' probably belongs to this species on its measurements (Serventy *et al.* 1971, who give 44–54 × 32–40 mm, Watson 1975). It is a known breeder in the Crozets (Despin *et al.* 1972).

Procellaria aequinoctialis: 3 eggs of this species (*cf.* Layard 1867a: 459) measure 80·9 × 54·6, 80·6 × 54·8 and 78·7 × 51·0 mm.

Fregetta tropica: I did not find the eggs mentioned by Layard (1867a: 459).

Pelecanoides georgicus/exsul: 2 eggs measure 44·3 × 32·4 and 40·9 × 31·1 mm and following Serventy *et al.* (1971), who give 35–42 × 27–31·5 mm, are probably referable to *P. exsul.* Another egg which does not look conspecific measures 38·5 × 31·5 mm and fits well with the measurements Despin *et al.* (1972: 60) give for *P. georgicus*. Layard (1867a: 460) only referred to skins of *P. urinatrix*, i.e. *exsul*, so the eggs are among the fruits of the second journey.

Phalacrocorax albiventer: Layard (1867a: 460) refers to eggs which I did not find.

Anas eatoni: this is the 'small teal' which Layard (1867a: 460) could not identify. Two eggs taken on the second journey measure 53·4 × 38·1 and 53·0 × 37·8 mm. The museum also holds an egg from Desolation (=Kerguelen) Island taken in 1876 which measures 51·8 × 37·1 mm. This is close to the figures in Kidder (1876): 45·7–55·4 × 35·6–38·1, av. (9) 51·8 × 36·7 mm and compatible with those in Despin *et al.* (1972: 68).

Chionis minor: it does not appear that Capt. Armson ever brought back further eggs to replace the one attacked by mice (Layard 1867a: 458).

Catharacta skua lonnbergi: there are 2 eggs of this species with an MS determination in the same hand as on all Crozet eggs but, unlike all the others, the scribe has not noted their provenance upon them. They measure 75·1 × 53·0 and 73·0 × 51·9 mm and are very probably those referred to by Layard (1867a: 459).

Larus dominicanus: 6 eggs measure 74·9 × 49·8, 74·3 × 49·8, 72·9 × 46·2, 72·8 × 51·1, 71·9 × 48·4 and 70·4 × 51·3 mm. The last egg has been placed with *C. skua* but looks misplaced there. Layard (1867a: 459) was uncertain which blackbacked gull bred there.

Sterna virgata/vittata: Despin *et al.* (1972: Table XL) show that it is not possible to discriminate between the eggs of these 2 terns, which both breed on the Crozets. The eggs measure 48·1 × 32·2, 46·8 × 31·9 and 44·4 × 32·0 mm. Layard (1867a: 459) called the species *S. meridionalis*.

If Layard had examined and reported all the material he received through Capt. Armson from the Crozet Islands, these islands' ornithology would have been substantially known much earlier.

Round Island, Mauritius

Puffinus pacificus: 7 eggs measure 59·0–66·0 × 38·8–41·4 mm.

Puffinus lherminieri: an unidentified small egg of this genus measures 47·3 × 31·6 mm. Murphy (1936: 688) cites similar measurements for the Galapagos race, *P. l. subalaris*, (48·5 × 33·8 and 47·1 × 32·9 mm). Serventy *et al.* (1971) give much greater measurements (av. 59 × 43 mm) for the other likely candidate, *Pterodroma arminjoniana*, mentioned by Watson *et al.* (1963). Vinson (1976) gives 55–66 × 40·5–48 mm for 18 modern eggs of *P. arminjoniana* from Round Island. Layard's record provides part of the confirmation called for by Watson *et al.* (1963) for regarding *Puffinus lherminieri* as at least a former breeder on Round Island. Temple (1976) thinks it may still breed there as well as above the Tamarin River gorge on Mauritius itself.

Sterna fuscata: 4 eggs measure 54·1 × 36·0, 52·1 × 35·1, 51·7 × 35·4 and 50·9 × 36·1 mm. Watson *et al.* (1963) and Staub (1973) do not record *S. fuscata* as breeding on Round Island.

It is apparent from Watson *et al.* (1963) that H.M.S. *Castor* on which Layard was travelling when he collected these eggs must have visited Round Island in November and Brooke (1976) shows that the year must have been 1856.

SANDY ISLAND, RODRIGUEZ

Anous stolidus: 8 eggs measure 50·2–53·2 × 35·4–38·7 mm. The eggs were collected in November 1856, a deduction from comparing the data on breeding season in Watson *et al.* (1963) and Layard's years of travel in Brooke (1976).

FARQUHAR ISLAND, PROVIDENCE

Phaethon rubricauda: one egg measures 62·5 × 44·1 and has a pale ground densely spotted with purple as well as having a few small blotches of that colour. It has only been identified to genus but in the light of the measurements given by Mackworth-Praed & Grant (1952) (64 × 46 mm as opposed to 50 × 37 for *P. lepturus* and 55 × 38 for *P. indicus*) it is clearly referable to this species even though it is not recorded here by Watson *et al.* (1963).

Sula dactylatra: one egg measures 66·4 × 44·4 mm.

Sula sula: an egg attributed to *S. dactylatra* measures 58·8 × 39·1 mm and should be placed with *S. sula* in the light of the measurements given by Serventy *et al.* (1971): 55–66 × 38–43 mm.

Fregata minor: 2 eggs measure 71·4 × 48·4 and 70·3 × 49·7 mm. This is the first breeding record from the Providence Islands (Brooke 1976).

Farquhar Island was visited in October or November 1856 for the reasons given under Sandy Island.

Mr. A. S. Cheke advises (*in litt.*) that the log of H.M.S. *Castor* no longer survives, so that it is not possible to obtain direct data on when the different localities from which material was obtained were visited. An examination of the *Cape of Good Hope Government Gazette* shows that H.M.S. *Castor* left Simonstown, the then British naval base at the Cape, on 10 October 1856 for Mauritius. It left Durban on 13 March 1857 for Port Elizabeth, which it reached on 17 March. It left two days later for Simonstown, which it reached on 25 March 1857. The most economical fit of the data in this paper and in Brooke (1976) seems to be: Simonstown to 40° 20′ S, 41° 00′ E where a few wintering seabirds were obtained, followed by a northeasterly tack to 32° 46′ S, 59° 13′ E where more wintering seabirds were obtained at the end of October or perhaps the beginning of November. Mauritius and Rodriguez to the north were next visited (in which order?) in November when birds laying in November had their eggs collected. Although the birds whose eggs were collected at Farquhar Island are predominantly October layers, it seems that it was not visited until late November after leaving Mauritius and Rodriguez. Thereafter, H.M.S. *Castor* continued northwest to the coast of northern Kenya where many Palaearctic waders in non-breeding plumage were obtained: this would be very feasible in December. It then proceeded down the African coast to at least Cabo Delgado in northern Moazambique where a nest-building *Nectarinia senegalensis* was obtained: this could be in

December or even January (Mackworth-Praed & Grant 1955). The visit to northwest Madagascar presumably came next, in February, before a return to the African coast near the mouth of the Zambezi, thereafter proceeding southwards, obtaining a few cold water seabirds off southern Mozambique in early March 1857, to reach Durban before 13 March 1857.

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References:

Berruti, A. 1977. Co-existence in the *Phoebetria* albatrosses at Marion Island. M.Sc. Thesis, University of Cape Town.

Brooke, R. K. 1976. Layard's extralimital records in his *Birds of South Africa* and in the South African Museum. *Bull. Brit. Orn. Cl.* 96: 75–80.

Despin, B., Mougin, J. L. & Segonzac, M. 1972. Oiseaux et mammifères de l'Ile de l'Est. *C.N.F.R.A.* 32.

Kidder, J. H. 1876. Contributions to the natural history of Kerguelen island. *Bull. U.S. Natn. Mus.* 3.

Layard, E. L. 1867a. On birds and eggs from the Crozette Islands. *Ibis* pp. 457–461.

— 1867b. *The Birds of South Africa.* Cape Town: Juta.

— 1869. Further notes on South-African ornithology. *Ibis* pp. 361–378.

Mackworth-Praed, C. W. & Grant, C. H. B. 1952, 1955. *Birds of Eastern and Northeastern Africa.* Vols. 1 & 2. London: Longmans Green.

Murphy, R. C. 1936. *Oceanic Birds of South America.* Vol. 2. New York: Macmillan.

Serventy, D. L., Serventy, V. & Warham, J. 1971: *The Handbook of Australian Sea-birds.* Sydney: Reed.

Staub, F. 1973. *Oiseoux de l'Ile Maurice.* Port Louis: Mauritius Printing.

Temple, S. A. 1976. Observations on seabirds and shorebirds on Mauritius. *Ostrich* 47: 117–125.

Vinson, J. M. 1976. Notes sur les procellariens de l'Ile Ronde. *Oiseaux Rev. Franc. Orn.* 46: 1–24.

Voisin, J. F. 1976. Observations sur les Petrels Géants de l'Ile aux Cochons (Archipel Crozets). *Alauda* 44: 411–429.

Watson, G. E. 1975: *Birds of the Antarctic and Sub-Antarctic.* Washington: Amer. Geophysical Union.

Watson, G. E., Zusi, R. L. & Storer, R. W. 1963. *Preliminary Field Guide to the Birds of the Indian Ocean.* Washington: Smithsonian Institution.

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Some observations of birds in Fah, northeast Eritrea

by Stephanie J. Tyler

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K. D. Smith's (1957) annotated checklist of the birds of Eritrea comprehensively covered the literature up to the end of his own observations in 1954. He listed 528 species and commented on the surprisingly large number of land Palaearctic migrants in relation to the small size of Eritrea.

Eritrea became annexed to Ethiopia in 1952 and Smith's data is incorporated into Urban & Brown's (1971) checklist of the birds of Ethiopia. Other ornithologists, such as Dr. J. S. Ash (1977, in press), Brother E. Johnson, C. F. Mann (1971) and J. Boswall (1971) provided more data mostly from the coastal areas near Assab and Massawa and from the Dahlak archipelago.

Between 6 June 1976 and 4 January 1977 the author and family were confined in an Eritrean Popular Liberation Front camp in an area known as Fah, north of Nacfa in northeast Eritrea, near the junction of the coastal

plain with the inland escarpment. The camp at Fah was rather below 300 m in a broad sandy wadi fringed with scattered trees and bushes, notably *Acacia tortilis*, *Balanites aegyptica*, *Zizyphus spina-christi*, *Salvadora persica* and *Calotropis procera*, and more localised clumps of *Tamarix*. A second wadi joining the larger one contained permanent flowing water, partly from a series of springs above a small waterfall, below which the small shallow river passed through a steep-sided gorge—opening out at one point to form a pool with a pebble bank at one edge—and after a further 300 m or so disappeared into the sand close to the junction of the two wadis. On either side of the wadis were dry, rocky volcanic hills dissected by steep-sided rocky gullies. The sparse vegetation on these hills included Acacias such as *A. melliphera*, and more trees and shrubs grew along the gullies. The habitats in this semi-desert area correspond to K. D. Smith's Type A1c (riparian woodland), Type A2 (dry Acacia woodland), Type Bb2 (lowland rivers) and Type A4a1 and a2 (rocky hills–cliffs and rocks).

Observations at Fah were necessarily limited; in particular the confiscation of my binoculars by the guerillas made identification of birds of prey and distant birds difficult or impossible. Many birds must have passed through Fah without my having noticed them. My movements were very restricted during the daylight hours during which I sat under a tall *Acacia tortilis* and close to clumps of *Salvadora*. Occasionally it was possible to erect a 20 foot mist net in the *Salvadora* bushes. A walk to the river each evening, a distance of about 600 m, and occasional short walks near the *A. tortilis*, were the extent of my movements from 6 June to 8 September, after which the days were spent beneath another tree, an *A. melliphera*, in a gully in the hills about 500 m from the main wadi. Movements were less restricted then and I could walk short distances into the hills. However, leaving the *Salvadora* bushes by the main wadi in early September was unfortunate because most Palaearctic passerine migrants were concentrated in their thick cover. In August a pan lid filled with water which also caught the drips from a water-filled goat skin, proved very attractive to normally skulking species such as Great Reed Warblers *Acrocephalus arundinaceus*. Few passage migrants apparently ventured into the hills and after 8 September recording of migrants was largely limited to the evening hour by the river and the walk to and from the river. Waders that arrived at Fah overnight and may have been by the river in the early morning would soon have been disturbed by passing guerillas and would have left before my evening visit.

Several Ethiopian species one would have expected to see were notably absent. Thus, no Fulvous Chatterers *Turdoides fulvus* or Drongos *Dicrurus adsimilis* were seen at Fah and hornbills and rollers were scarce. Kingfishers were also absent, despite a wealth of food in the form of tadpoles in the river, though fish were absent. No doubt the extremely limited nature of both my observations and the area that I covered account for the comparatively small number of species seen; but Fah is a dry environment, apart from the stretch of river, and the resident avifauna must be very restricted in species. The main gaps in my list must be of migrants and visitors.

In the following systematic list remarks have been made where my observations differ from or add to Smith's data. Numbers against each species refer to the numbers given in Urban & Brown (1971); those in brackets correspond to those used by Smith (1957).

SYSTEMATIC LIST

(24) 17. *Ixobrychus minutus* Little Bittern. Singles 21.ix and 14.x. Smith recorded it only as a spring passage migrant at over 2300 m, as did Urban & Brown (1971); it has since been caught between late viii and late x elsewhere in Ethiopia (Ash *in litt.*).

(22) 19. *Nycticorax nycticorax* Night Heron. An immature, possibly always the same individual 19–20.x, 3.xi and 5.xi feeding on tadpoles by the river at dusk and sheltering in a small cave during daylight. Smith found it scarce throughout Eritrea and was unsure whether it was a Palaearctic migrant or resident.

(19) 21. *Ardeola ralloides* Squacco. Singles seen most days 3.ix–10.xi, sometimes several together, max. 5 on 27.ix. One bird was picked up emaciated and exhausted. Smith found a southward coastal movement in late ix and early x, with only occasional individuals inland.

(18) 22. *Ardeola ibis* Cattle Egret. Single bird by the river early viii, 7 on 31.viii.

(15) 26. *Egretta intermedia* Yellow-billed Egret. 1–2 on 10, 11, 15 and 19.x. 18 unidentified egrets seeen 13.x were thought to be this species but may have been *E. schistacea*. Smith found *E. intermedia* to be rare but he describes *E. schistacea* as a very common resident near the coast.

(16) 27. *Egretta garzetta* Little Egret. Single bird 6–8.x. Smith recorded it as a common passage migrant late ix–early x.

[(13) 32. *Ardea purpurea* Purple Heron. Probably 2 on 26.ix and another on 21.x flying noisily overhead and attempting to land by the river. Smith recorded a spectacular migration with parties of up to 70 birds moving south along the coast, ix and x.]

(26) 34. *Scopus umbretta* Hammerkop. Singles 31.vii and 20.xii.

(50) 62. *Anas strepera* Gadwall. One exhausted immature male, 3.xi. Smith states regular on passage in x.

(53) 70. *Anas querquedula* Garganey. Single 22.viii. The commonest duck according to Smith, with the earliest arrival early vii, to late x.

(78) 84. *Milvus migrans* Black Kite. A juvenile, 16 and 23.viii. 3–4 overhead, 8.xi and a single 25.xii were probably *M. m. migrans* which Smith found an abundant passage migrant xi and xii.

(66) 86. *Neophron percnopterus* Egyptian Vulture. Frequently seen in a pair or singly, vi–viii, probably breeding on cliff nearby.

[(61) 90. *Gyps* sp. 2 on 23.vii were thought to be *G. fulvus*, but no positive identification.]

(89) 94. *Circaetus gallicus* Short-toed Harrier Eagle. Single, low over the hills, 8.xi and 3.i.

(92) 97. *Terathopius ecaudatus* Bateleur. Singles, 29.vii and 3.i.

(103) 102. *Melierax metabates* Dark Chanting Goshawk. A juvenile present vii–i. Prey items included lizards as well as birds, and an attempt was made to catch a young Ground Squirrel *Xerus rutilus*.

(100) 112. *Accipiter badius* Shikra. Frequent sightings of single birds, vi–i.

(95) 115. *Buteo buteo vulpinus* Steppe Buzzard. Frequently overhead, x and xi.

(83) 122. *Aquila rapax* Tawny Eagle. Several sightings of *A. r. raptor* or *A. r. orientalis* 22.viii–10.xii. Smith recorded *A. r. raptor* as a common resident and *A. r. orientalis* as an abundant autumn immigrant.

(86) 126. *Hieraaetus fasciatus* African Hawk Eagle. Occasional sightings throughout our stay at Fah, sometimes at close quarters.

(87) 131. *Polemaetus bellicosus* Martial Eagle. A pair with two juveniles seen frequently vi–ix.

(73) 137. *Falco tinnunculus* Kestrel. Seen regularly after ix, probably the migrant *F. t. tinnunculus*.

(69) 145. *Falco biarmicus* Lanner. Frequent sightings, vi–i of 1–2 birds.

(—) 150. *Ammoperdix heyi* Sand Partridge. A pair flew up from the edge of the river on 31.xii and one was clearly observed on a low cliff. Not seen or heard until then. Smith only included *A. heyi* in an appendix of species whose presence required confirmation; the only record was of one chick doubtfully identified by Zedlitz (1910) on an island off Massawa.

(120) 178. *Porzana porzana* Spotted Crake. One feeding by river near patch of *Juncus*, 16.x; twice, when disturbed, it flew to nearby thicket of Castor-oil plant *Ricinus communis*. Smith found it a fairly common spring passage migrant usually above 2300 m, scarcer in the autumn.

(123) 184. *Gallinula chloropus* African Moorhen. One by river, 17.x, took cover in a small cave in rocks by the water when disturbed. Smith found it an uncommon, shy bird of upland streams over 2300 m.

(137) 215. *Charadrius tricollaris* Three-banded Plover. One pair resident along a 500 m stretch of the river for the duration of our stay. Three breeding attempts — in vii, ix and

xii; young hatched from the ix laying on 24.x, and were first seen flying after 30 days. Other pairs and family groups passed through Fah during viii.
(165) 227. *Tringa glareola* Wood Sandpiper. Singles by the river, 23.viii, 22–25. ix and 2 on 15.xii.
(164) 228. *Tringa ochropus* Green Sandpiper. Singles, 16.vii, 23.viii, 8.ix and 2.x. Smith's earliest arrival was 25.vii.
(163) 229. *Tringa hypoleucos* Common Sandpiper. Singles, 24–25.vii, 22–23.viii, 2.ix and 15–16.x.
(152) 235. *Gallinago gallinago* Snipe. One on 5.xi in *Juncus* patch by the springs.
(157) 240. *Calidris minuta* Little Stint. One on 3.ix and 4 on 2.xi.
(160) 245. *Philomachus pugnax* Ruff. 2 on 22.viii (flying ahead of an advancing mass of water which temporarily flooded the wadi), one on 24.viii, several on 19.ix and one on 20–21.ix.
(150) 246. *Himantopus himantopus* Black-winged Stilt. An adult, 18–19.ix and an immature, 21–24.ix.
(203) 290. *Pterocles lichtensteinii* Lichtenstein's Sandgrouse. Heard most evenings from lower down the wadi where there was more flowing water.
(212) 302. *Streptopelia roseogrisea* Pink-headed Dove. Not seen until first week of viii when 1–2 individuals arrived; common ix–x, then disappeared. Smith recorded local movements to foot of escarpment in hottest months.
(213) 303. *Streptopelia senegalensis* Laughing Dove. The commonest dove at Fah, less abundant after ix.
(214) 304. *Oena capensis* Namaqua Dove. Small flocks often feeding with *S. senegalensis* until ix. Only occasional individuals recorded after ix, suggesting local movement elsewhere. Both this species and *S. senegalensis* were trapped for food in crude snares by the guerillas.
(219) 328. *Cuculus canorus* Cuckoo. One on 25.vii, 11.viii, 11.x and 15.x, probably *C. c. canorus*; but Smith considered it an autumn passage migrant 18.viii–late ix.
(272) 341 or (273) 342. *Bubo* sp. Seen amongst rocks in ravine, 2.x–24.x, feathers found in a cave further up in the hills. Not positively identified but similar to *B. lacteus* with unspotted, finely barred underparts and pink eye-lids. However, *B. lacteus* prefers resting in large trees, whereas *B. africanus* prefers rocky ravines (Smith). *B. africanus* was seen further south in wooded hills at about 1000 m. Other eagle owls were seen north of Fah on the coastal plain during the night of 4.i. Dr. J. Ash (*in litt.*) suggests that *B. ascalaphus* cannot be ruled out.
(270) 344. *Glaucidium perlatum* Pearl-spotted Owlet. Only seen once, 31.xii, but frequent along wadis south of Fah.
(276) 352. (277) 353. *Caprimulgus* sp. From vi–i a female nightjar flew each evening from the hills before dusk to a rocky knoll near the main wadi and for 15–20 minutes performed aerial antics, repeatedly flying up a few feet from the ground. Perhaps this was feeding behaviour but food items were never seen and the bird flew to exactly the same spot each evening, only about 10 m from us. It had a uniform appearance but a slight collar was evident. Churring and wing-clapping were heard in the hills during vi. A male, flushed from the ground and later from a tree in a rocky gully in the hills in early vii, had white tips to the outer tail feathers. At the time I tentatively identified them as Dusky Nightjars *C. fraenatus*, but Smith found this species only in the highlands near Asmara, although White (1965) did include rocky scrub in Eritrea within its range. Nubian Nightjar *C. nubicus*, which Smith found at and near the coast, is perhaps more likely on range and habitat, but as J. S. Ash points out (*in litt.*), the churring call is certainly not *nubicus*.
(302) 363. *Apus* sp. Possibly Mottled Swift *A. aequatorialis* seen on 21 and 27.vii in hundreds flying low overhead and feeding on winged ants; noted as large dark swifts compared with *A. affinis* which was also flying amongst them. However, Smith only recorded *A. aequatorialis* from high altitudes and possibly I was confused by size, and Common Swifts *A. apus*, which Mann (1971) recorded in vast numbers in coastal Eritrea in viii and ix, were involved.
(304) 369. *Apus affinis* Little Swift. Present for the duration of our stay; 4 pairs breeding on cliffs by the river. Smith recorded it breeding only above 1300 m, wandering to the lowlands in winter.
(283) 373. *Colius macrourus* Blue-naped Mousebird. Common in groups of up to 6–7 from vi.–i.
(248) 384. *Merops apiaster* European Bee-Eater. A flock of about 30, 24.viii and 2 flocks passing over, 25.viii.
(249) 385. *Merops superciliosus persicus* Blue-cheeked Bee-Eater. Two exhausted birds by the river, 29.viii and a flock, 6.ix, earlier dates than known to Ash (in press), but Mann (1971) recorded it on the Dahlak Islands and at Massawa from 20.viii.

(252) 388. *Merops albicollis* White-throated Bee-Eater. Several pairs along the main wadi, vi–vii. Small flocks (? family groups), viii and ix, then not seen again. Presumed breeding on cliffs vi–vii.
(235) 395. *Coracias abyssinica* Abyssinian Roller. Single, 26.viii. Smith noted that it wanders during the autumn. More were seen by a wadi with more trees, about 30 km from the camp at Fah.
(261) 399. *Upupa epops epops* Hoopoe. 1–4 seen daily 20.viii–early ix, an earlier arrival date than given by Ash (in press).
(256) 404. *Tockus nasutus* Grey Hornbill. Occasional visitor, heard several times, and family group of 4 birds seen once by main wadi, 21.ix; common further south in lowland Acacia scrub north of the Asmara to Massawa road, early vi.
(257) 405. *Tockus erythrorhynchus* Red-billed Hornbill. Not seen at the camp but several seen about 30 km away by a tree-lined wadi.
(288) 416. *Lybius melanocephala* Black-throated Barbet. 2–3 pairs vi–i. Nested in a hole in a *Balanites* tree by a ravine, presumed to be incubating in xii.
(290) 420. *Trachyphonus margaritatus* Yellow-breasted Barbet. Two pairs at Fah. A pair was feeding young in a cliff hole on 26.v further south in Eritrea.
(293) 430. *Campethera nubica* Nubian Woodpecker. Frequently seen, vi–i.
— 436. *Thripias namaquas* Bearded Woodpecker. Seen once, vii. Smith knew of no records.
(308) 447. *Ammomanes deserti* Desert Lark. One pair seen most days, vi–i, on rock-strewn slope between the hills and the wadi. During xi and xii this pair became very tame, visiting us each morning for breadcrumbs. Mackworth-Praed & Grant (1957) note that this species is usually shy.
(309) 457. *Galerida cristata* Crested Lark. Single birds 26.vii and 29.x.
(424) 459. *Riparia riparia* European Sand Martin. First seen 7.viii, a single bird; several 3.ix and a flock 17.ix; then seen nearly daily in small groups late ix–x.
(419) 462. *Hirundo rustica* Swallow. First seen 9.viii, a single bird; 12 on 25.viii and small numbers daily to end x.
(422) 468. *Hirundo daurica* Red-rumped Swallow. Single on 8.ix and 3 together 18.ix. Smith noted that *H. d. rufula* is probably a regular passage migrant but that the resident *H. d. melanocrissa* may also move down to the coastal plains in winter.
(429) 472. *Hirundo fuligula* African Rock Martin. Resident vi–i, breeding on cliffs by the river and in the hills, incubating in xii; recently fledged young seen 3.i.
(320) 476. (323). *Motacilla flava* Yellow Wagtail. Passage migrant first seen 29.viii, then flocks of over 20 seen daily by the river until 29.x. Four probable races distinguished—*lutea* on 6.ix, *feldegg*, *thunbergi* and *flava*; mixed *flava* and *thunbergi* flocks were most common. Smith recorded *M. flava* late viii–early v. An out of season bird seen 8.vi and further south in Eritrea a pair (male *feldegg*), both with injured legs, 31.v.
(319) 477. *Motacilla cinerea* Grey Wagtail. Single bird, 12.viii, then seen daily singly or in groups of up to 6 until 27.x. Smith first noted Grey Wagtails on 22.viii.
(317) 479. *Motacilla alba* White Wagtail. Recorded from 20.x until my departure on 4.i, numbers increasing to a maximum of 19. One of the few Palaearctic migrants to remain at Fah after x. Smith found it a late migrant, arriving first on 14.x in Eritrea, but Mann (1971) recorded it on the Dahlaks during early ix.
[(325). 481. *Anthus campestris* Tawny Pipit. Probably this species seen low on the hills, 31.xii.]
(326) 484. *Anthus similis* Long-billed Pipit. 1–2 pairs frequently seen vi–i, usually on rocks near the river, coming to drink. Smith noted that *A. s. nivescens* should occur in eastern Eritrea but did not obtain a specimen.
(329) 486. *Anthus trivialis* Tree Pipit. Usually seen singly but up to 3 birds 12.ix.–20.x. Smith only recorded this pipit above 1250 m.
(330) 487. *Anthus cervinus* Red-throated Pipit. First seen 22.x, 2 birds; then 1–2 daily to 3.xi.
(334) 494. *Pycnonotus barbatus* White-vented Bulbul. Frequent tame resident. Breeding south of Fah, incubating on 5.vi, indicating laying in v or vi.
(440) 513. (441). *Lanius collurio* Red-backed Shrike. *L. c. collurio* seen frequently 29.viii–11.xii—single males and females; red-tailed *L. c. isabellinus* seen from 29.ix up to my departure 4.i. One bird with unusually large white wing patches wintered close to the tall *Acacia tortilis* by the wadi and could be seen daily. Occasionally the resident *L. excubitor* drove this red-tailed shrike away. Smith noted that the nominate race was only a passage migrant mid viii–late ix.
(437) 514. *Lanius minor* Lesser Grey Shrike. Two seen separately, 28.viii and 30. viii, feeding on cicadas.

(436) 515. *Lanius excubitor* Great Grey Shrike. Pair present for the duration of my stay. They became remarkably tame, scavenging pieces of goat meat and attracted to a tin of sugar around which large wasps gathered. Single birds in viii and ix may have been passage migrants of other than the resident race.

(442) 520. *Lanius senator* Woodchat Shrike. A female arrived 2.ix and remained in a small area close to the *Acacia tortilis* until 7.ix.

(439) 521. *Lanius nubicus* Nubian Shrike. Only one record, 25.x. Surprisingly uncommon, as it was common in the Tigre lowlands in i, ii and iii 1976.

(523) 369. *Saxicola rubetra* Whinchat. Singles 12.ix and 3.xi. Smith noted that it did not winter in Eritrea, leaving by mid ix but Ash (in press) recorded it in Ethiopia 26.viii–first week v.

(358) 530. *Oenanthe xanthoprymna* Red-tailed Wheatear. A male seen in a rocky gully 27.xii and 31.xii–3.i.

(352) 531. *Oenanthe isabellina* Isabelline Wheatear. 1–3 25.viii–22.ix. Surprisingly this was the only autumn wheatear passage migrant seen.

(356) 532. *Oenanthe leucopyga* White-rumped Wheatear. Resident pair seen frequently. Courtship observed in the hills in x and xi and a juvenile seen in vii. Smith recorded it as a local scarce wheatear, confined to lava fields in lower Dancalia from Assab north to Gaharre and perhaps further. The Fah records are indeed further north. I also recorded it on the laval slopes of Mt. Ertale, Tigre in March 1976.

[(360) 534. *Oenanthe bottae* Red-breasted Wheatear. One brief sighting, 8.ix, probably of this species. Smith had one record of *O. b. heuglini* from near Keren.]

(362) 535. *Cercomela melanura* Black-tailed Rock Chat. Common resident amongst rocks in the hills and feeding under bushes by the main wadi. Juveniles seen in early i, indicating laying in xi or xii.

(349) 545. *Monticola solitaria* Blue Rock Thrush. First seen 6.x, thereafter up to four daily up to the time of my departure in early i. Ash (in press) recorded the earliest arrival date as 13.x. (No rock Thrushes *M. saxicola* seen.)

(373) 547. *Phoenicurus ochruros* Black Redstart. A male in a rocky gully, 9.xii. A poorly known species in Ethiopia; Smith gives only one record, Feb. 1907; Cheesman recorded it as local and not uncommon in tree-forest at 1300 m but not seen on the high plateau (*in* Moreau 1972); Mann (1971) recorded it in 1962 in 'ones and two's on the Dahlak Archipelago during the last week of August and first week of September'. Urban & Brown (1971) summarise its status as an uncommon migrant in the north of the west highlands, but there is a paucity of recent records. I recorded two near the crater of Mt. Ertale, Tigre in March 1976.

(372) 548. *Phoenicurus phoenicurus* Redstart. Common passage migrant, 10.x–5.xi, both races—*samamiscus* and *phoenicurus*. A female on 2.xi was feeding from rocks on the ground in the manner of a Red-tailed Chat *Cercomela familiaris*.

(371) 549. *Cercotrichas podobe* Black Bush Robin. Common resident, breeding vi.

(386) 550. *Cercotrichas galactotes* Rufous Bush Chat. Common and breeding v and vi. After ix it disappeared. A single seen late x may have been a migrant *C. g. syriaceus*. Smith made no mention of any regular movement of *C. g. minor*, describing it as resident.

(374) 560. *Luscinia svecica* Bluethroat. A male *L. s. magna* by the river 18.ix–3.x. A second male 18.x; both fed on beetle larvae living in vertical burrows in moist sand by the river. Smith recorded it as a scarce passage migrant.

(375) 561. *Irania gutturalis* White-throated Robin. One male, 26.viii. Smith found it a common autumn passage migrant 28.viii–23.ix above 2000 m.

(394) 586. *Acrocephalus scirpaceus* Reed Warbler. One caught 1.ix, but there were numerous *Acrocephalus* warblers in *Salvadora* bushes along the wadi 25.viii–end ix, some of which may well have been *A. palustris* or *A. scirpaceus*.

(392) 588. *Acrocephalus arundinaceus* Great Reed Warbler. Several birds passing through between 14.viii and 25.viii, an earlier arrival date than met with by Ash (*in litt.*). Two were caught, both in tail moult.

(390) 596. *Hippolais pallida* Olivaceous Warbler. Present throughout much of our stay, first seen 13.vi. A pair was observed in the *Acacia tortilis*, 27.vii but none after x. Possibly it breeds in Eritrea.

(381) 598. *Sylvia hortensis* Orphean Warbler. Birds seen between xi and i were believed to be this species but some may have been confused with the resident *S. leucomelaena*.

(379) 599. *Sylvia borin* Garden Warbler. Passage migrant seen only 25–26.viii.

(380) 600. *Sylvia atricapilla* Blackcap. Seen daily 11.x–28.x.

(378) 601. *Sylvia communis* Whitethroat. Only seen 12.x–22.x.

(377) 602. *Sylvia curruca* Lesser Whitethroat. Seen 28.viii–16.x, an earlier arrival date than Smith's of 16.ix, and 12.ix which Mann (1971) recorded.
(383) 605. *Sylvia mystacea* Ménétriés Warbler. Only seen twice, on 7.ix.
(382) 606. *Sylvia leucomelaena* Red Sea Warbler. Frequent throughout our stay. Often in *Acacia melliphera* in rocky gullies but also feeding in trees by the main wadi. Courtship behaviour and song noted, particularly in mid xii. Smith also noted this warbler in steep gullies with sparse *Acacia* cover below 300 m.
(396) 607. *Phylloscopus trochilus* Willow Warbler. Numerous records during late viii and ix, some of which may have been also of *P. collybita*, but song not heard. One bird seen on 24.x and 27.x in *Salvadora* by the river had a grey uniform appearance from a distance like that of *Sylvia borin* but a slighter, less rounded appearance; at close quarters green on the wings, greyish-white underparts and yellow tinge to the breast and vent were noted. Possibly *P. bonelli*, but the only other previous record for Eritrea or Ethiopia was from Massawa by Beals in 1965.
(399) 632. *Spiloptila rufifrons* Red-faced Warbler. Only one pair seen, 29.x, in stunted *Acacia* by the edge of a rocky gully in the hills, despite being constantly alert for this species. Smith found it locally common below 800 m.
(401) 639. *Sylvietta brachyura* Crombec. Frequently seen, vi–i.
(355) 644. *Muscicapa striata* Spotted Flycatcher. Perhaps the most numerous and conspicuous passage migrant at Fah, up to six birds seen daily 17.viii–3.xi. Smith recorded it as common in the autumn, 18.viii–late x.
(341) 655. *Batis orientalis* Grey-headed Puff-back Flycatcher. Frequently seen, vi–i; male singing vii and viii, and a family group seen 22.xii, indicating laying in xi.
(477) 670. *Anthreptes metallicus* Pigmy Sunbird. Abundant vi–ix but absent x–i (when I left). Smith also noted this marked regular local migration in eastern Eritrea; he found that birds appear on the coastal plain in i and ii and depart, probably for the foot of the escarpment in vi. At Fah, by ix, sunbirds were in non-breeding dress; during vii and viii they had gathered with juveniles during the day in the tall *Acacia tortilis*, where up to 60 were present at mid-day. Breeds v and vi, but a late nest containing young was found 28.viii.
(478) 679. *Nectarinia habessinica* Shining Sunbird. Much less common than *A. metallicus* but 1–4 usually seen daily throughout our stay. Four males displaying in the same *Acacia* 11–12.viii; females buildings nests 9.viii and 30.viii; another pair feeding young in a nest at end viii. Further south in Eritrea, in lowlands east of Asmara, a pair was feeding young in a nest 27.v.
(524) 691. *Emberiza hortulana* Ortolan. 1–4 by the river 20.ix–28.ix. Smith noted it as an abundant passage migrant above 1300 m with a few staying to winter.
(528) 697. *Emberiza striolata* House Bunting. Not common, but seen on several occasions, most months from vi–i, usually in pairs.
(503) 718. *Amadina fasciata* Cut-throat. A small flock, 27–28.vii.
(510) 724. *Estrilda rhodopyga* Crimson-rumped Waxbill. Seven on 30.x and four on 28.xii.
(502) 738. *Lonchura malabarica* Silverbill. 1–2 pairs seen frequently in all months, usually by the river.
(497) 747. *Ploceus galbula* Ruppell's Weaver. Common along the main wadi, with scattered small breeding colonies in *Acacia* trees; nest building in xi and xii. Further south in Eritrea I saw active breeding colonies with eggs and nestlings in v and vi.
(486) 786. *Passer luteus* Sudan Golden Sparrow. Two immature birds first seen 14.viii when they came to drink from a pan lid; flocks of up to 30 seen occasionally up to i, but all in non-breeding dress. Smith found it on the coastal plains below 300 m and breeding in i.
(487) 789. (488) 790. *Petronia* sp. A single bird in the main wadi on several occasions in vi was one of these two species. Fleeting glimpses suggested *P. dentata* but J. S. Ash (*in litt.*) believes *pygita* is more likely on habitat, although Smith found *dentata* in *Acacia* in Eritrea. *P. brachydactyla* was ruled out on dates.
(490) 791. *Sporopipes frontalis* Speckle-fronted Weaver. A small flock seen once very briefly in vii. Smith however, noted its absence from eastern Eritrea, although Friedmann (1937) indicated that it did occur there. *S. frontalis* was common on the Tigre/Eritrean border at heights of up to about 2000 m in v, and in lowlands east of Asmara in late v, when it was nesting.
(461) 802. *Cinnyricinclus leucogaster* Violet-backed Starling. Common in vi and vii, feeding on *Salvadora* berries, but only rarely seen after vii; 3 females seen 28.viii. Smith stated that plateau and western birds were migrants but that eastern birds were resident throughout the year. In lowlands east of Asmara this species was feeding small young in a hole in a tree in late v.

(460) 811. *Creatophora cinerea* Wattled Starling. Ten on 23.vii and one male in breeding dress 30.viii.
(471) 814. *Buphagus erythrorhynchus* Red-billed Oxpecker. Seen frequently on camels, goats and donkeys passing through Fah.
(453) 815. *Oriolus oriolus* Golden Oriole. A male, 27.viii, was the first of many passing through. 1–2 seen daily to 24.ix Smith recorded it as a common autumn and spring passage migrant, from 1.ix to third week of x. Mann (1971) recorded them on the Dahlaks on 28–29.viii.
(459) 824. *Corvus ruficollis* Brown-necked Raven. Seen sporadically throughout our stay.

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References:

Ash, J. S. 1977. Four species of birds new to Ethiopia and other notes. *Bull. Brit. Orn. Cl.* 97: 4–8.
— In press. The status of Palaearctic Birds in Ethiopia. *Ostrich.*
Boswall, J. 1971. Notes from coastal Eritrea on se ected species. *Bull. Brit. Orn. Cl.* 91: 81–84.
Friedmann, H. 1930, 1937. Birds collected by Childs Frick Expedition to Ethiopia and Kenya Colony, Pts 1–2. *U.S. Nat. Mus. Bull.* 153.
Mackworth-Praed, C. W. & Grant, C. H. B. 1957. *African Handbook of Birds: Birds of Eastern and North Eastern Africa.* Vols. 1 and 2. London.
Mann, C. F. 1971. Migration in the Dahlac Archipelago and the neighbouring mainland of Ethiopia, autumn 1962. *Bull. Brit. Orn. Cl.* 91: 41–46.
Moreau, R. E. 1972. *The Palaearctic–African Bird Migration Systems.* Academic Press: London, New York.
Smith, K. D. 1957. An annotated check list of the birds of Eritrea. *Ibis* 99: 1–26, 307–337.
Urban, E. K. U. & Brown, L. H. 1971. *A Checklist of the Birds of Ethiopia.* H.S.I. Univ. Press: Addis Ababa.
White, C. M. N. 1965. *A Revised Checklist of African Non-passerine Birds.* Government Printer: Lusaka.
Zedlitz, O. 1910. Meine Ornithologische Ausbeute in Nordost Afrika. *J. Orn.* 58: 280–394, 731–807; 59: 1–92, 591–613.

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On the validity of *Alcedo cristata robertsi* Peters, 1945

by P. A. Clancey

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Sharpe (1892) appears to have been the first to demonstrate the existence of geographical variation in the continental African populations of the Malachite Kingfisher *Alcedo cristata* Pallas, 1764: Cape of Good Hope, Cape. Salomonsen (1934) and other workers in the 1930's acknowledged this variation by recognising the nominate subspecies from South Africa, placing the other continental populations in *A. c. galerita* Müller, 1776: Senegal. Roberts (1932, 1935) described and recognised a third subspecies from the arid interior of southern Africa: *Corythornis cristata longirostris* (1932), the type-locality of which is Kabulabula, Chobe R., northern Botswana. As pointed out by Peters (1945), when the Genus *Corythornis* is merged with *Alcedo*, Roberts' name *longirostris* is not available because of the prior *Alcedo longirostris* Radde, 1884: Caucasus, a synonym of *A. atthis atthis* (Linnaeus), 1758. To replace the pre-occupied *A. c. longirostris* (Roberts), 1932, Peters proposed *A. c. robertsi*.

In their important study of birds from Gabon and the Moyen Congo,

Rand, Friedmann & Traylor (1959) confirmed the findings of Salomonsen, at the same time rejecting *A. c. robertsi*, synonymized earlier with the nominate subspecies by Vincent (1952). Winterbottom (1961) expressed the view that the bill-length character used by Rand *et al.*, Salomonsen and others to uphold two mainland races of the Malachite Kingfisher was invalid, as on this variable alone *galerita* was certainly not separable from *cristata*. In a re-examination of the variation, Clancey (1965) confirmed that *cristata* and *galerita* were separable on the basis of ventral colouration. At that time, following Rand *et al.*, it was considered that *robertsi* should be treated as synonymous with *galerita*. Recently in the course of correspondence, Mr. M. P. Stuart Irwin, Director of the National Museum of Rhodesia, Bulawayo, expressed the view that *robertsi* was valid on the basis of the series in the collection under his control, and requested that I reopen the question of its resuscitation.

Variation in the continental populations of *A. cristata* affects the lengths of the bill and the wing, the degree of saturation of the under-parts and the colour of the under wing-coverts. Most arrangements of the populations have relied heavily on size characters, but as I have shown (1965), variation in the colour of the venter provides a more satisfactory means of arranging the populations of this kingfisher into admissible subspecies. When he separated northern Botswana birds as *C. c. longirostris* = *A. c. robertsi*, Roberts (1932) characterized them as averaging smaller than *A. c. cristata* of South Africa, but with the bill longer, and with the underside of the wing paler. The new subspecies was proposed on 17 skins and 16 of nominate *cristata*.

The pooled resources of most South African museums and the National Museum of Rhodesia have enabled me to examine 24 specimens from the population named as *robertsi* and from immediately vicinal populations. Compared with Cape topotypes of the nominate subspecies, material from northwestern Rhodesia, northern Botswana and northern South West Africa stands apart on the starkly whiter throat and abdominal surfaces, and in moderately worn birds by the wholly whiter venter. The under wing-coverts are paler, less reddish cinnamon, and the wing-edge is whiter. The shift to a whiter ventral surface is perhaps better marked in the juveniles than in the adults, and, moreover, seems less likely to have been enhanced in any way by environmental factors, such as solar bleaching or abrasion, as I suspect has been the case in some of the whiter ventralled adults. In juveniles of *robertsi* the venter is whiter from the throat to the abdomen, and the pinkish buff or cinnamon is restricted to the lateral surfaces, there being no tendency to have a breast-band as in the nominate race.

TABLE 1

Wing measurements (mm) of *Alcedo cristata*

A. c. cristata		*Wing*	*Mean*	*Standard deviation*	*Standard error*
Cape	20 ♂♀	59–64	60·5	1·32	0·30
Natal	20 ♂♀	58–63	60·0	1·42	0·32
Transvaal	20 ♂♀	57–61	59·2	1·25	0·28
Rhodesia	25 ♂♀	56–62	58·5	1·56	0·31
A. c. robertsi					
Botswana	22 ♂♀	53·5–59	56·4	1·51	0·32

Compared with the nominate race, *robertsi* also reveals a satisfactory size-difference, the wing being shorter in series (Table 1). The culmen length from base in 12 ♂♀ of *A. c. cristata* from the Cape is 32·5–39·5, *versus* 35–39 mm in *robertsi*, confirming the findings of Winterbottom that there is no statistically significant difference in bill-length between these two races.

Compared with *A. c. galerita*, *A c. robertsi* is distinguishable on the basis of the more starkly white throat, white as opposed to buff belly, and in having the under wing-coverts paler and the wing-edge whiter. As in the comparison with the nominate race, *robertsi* wears to a wholly whiter ventralled bird than in *galerita*. The differences postulated in respect of the juveniles of *robertsi* also hold when a comparison is effected with juvenile material of *galerita*, the former being wholly whiter from throat to crissum. In size there is no difference between the two races.

In conclusion, a re-examination of the bulk of the material of the Malachite Kingfisher held in southern African museums indicates that *A. c. robertsi* should be recognised as a valid subspecies, the characters and ranges of the three mainland African races of this kingfisher being as follows:

(a) *Alcedo cristata cristata* Pallas, 1764

Throat buffy white; breast-band, sides and flanks dull ochraceous-tawny; belly light buff. Juvenile buffy white on throat, rest of venter vinaceous-cinnamon, darkest across the breast. Wings of ♂♀ 58–64 mm (Cape & Natal).
Range: Southern South West Africa, the Cape, Orange Free State, Natal and Zululand, southern Sul do Save, Moçambique, the Transvaal and Rhodesia.

(b) *Alcedo cristata robertsi* Peters, 1945

Throat whiter than last; breast, sides and flanks darker tawny; belly whitish. Worn adults wholly whiter below. Under wing-coverts paler and wing-edge whiter. Juvenile whiter from throat to crissum. Size smaller: wings 53·5–59 mm.
Range: Northern South West Africa, southern Angola, Caprivi Strip, northern Botswana, northwestern Rhodesia and southwestern Zambia.
Remarks: Two specimens of *A. c. robertsi* in the collection of the Transvaal Museum, a ♀ from Kabulabula, northern Botswana, dated 27 July 1930, and an unsexed example from Linyanti, Caprivi Strip, dated 12 October 1970, differ from all other adult Malachite Kingfishers of the three continental races available in having the pileum barred dull grey and black as opposed to caerulean and black, while the normal lustrous bluish violet of the dorsum and wings is replaced by light caerulean blue. The significance of these aberrant specimens is currently uncertain.

(c) *Alcedo cristata galerita* Müller, 1776

Differs from nominate *cristata* in having the breast, sides and flanks darker and more saturated tawny, and with the underwing still darker, the wing-edge duller. Juvenile darker below with a better developed breast-band. Size as in *robertsi*.
Range: Moçambique north of the Limpopo R., Malawi, and Zambia and Angola north of *robertsi*, thence throughout remainder of African mainland range of species.

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References:
Clancey, P. A. 1965. On the variation exhibited by the continental populations of the Malachite Kingfisher *Alcedo cristata* Pallas. *Ostrich* 36 (1): 34, 35.
Peters, J. L. 1945. *Check-List of Birds of the World*. Vol. 5: 176. Cambridge: Mass.
Rand, A. L., Friedmann, H. & Traylor, M. A. 1959. Birds from Gabon and Moyen Congo. *Fieldiana*, Zool. 41 (2): 281, 282.
Roberts, A. 1932. Preliminary descriptions of sixty-six new forms of South African birds. *Ann. Transv. Mus.* 15 (1): 25.
Roberts, A. 1935. Scientific results of the Vernay-Lang Kalahari Expedition, March to September, 1930. *Ann. Transv. Mus.* 16 (1): 92, 93.
Salomonsen, F. 1934. Zur Gliederung einiger westafrikanischer Eisvogel. *Journ. f. Ornith.* 82: 237–246.
Sharpe, R. B. 1892. Family Alcedinidae in *Cat. Birds Brit. Mus.* 17: 165.
Vincent, J. 1952. *Check List of the Birds of South Africa*. p. 42. Cape Town.
Winterbottom, J. M. 1961. Systematic notes on birds of the Cape Province: XIV. *Alcedo cristata* (Pallas). ***Ostrich*** 32 (2): 97, 98.

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Inland observations of Barau's Petrel *Pterodroma baraui* on Reunion

by M. de L. Brooke

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Barau's Petrel *Pterodroma baraui* was first described by Jouanin (1963). Since then several specimens have been collected and many seen, and the available information on the species' biology was summarised by Jouanin & Gill (1967). These authors considered *P. baraui* to belong to the group of tropical petrels included in the polytypic species *Pterodroma hasitata*. Only one nest has ever been found, not on Réunion, the type locality, but on Rodrigues (Cheke 1974). This note describes further observations on the species in the Cirque de Cilaos, Réunion, made daily 15–23 January 1974 and, in particular, comments on the diurnal activity pattern at a time when most breeding birds are likely to be incubating eggs.

Study area, weather and methods

Réunion, a volcanic island of extremely rugged topography, is roughly elliptical in shape, about 70 km long from northwest to southeast and about 50 km from northeast to southwest. The Cirque de Cilaos (*c.* 21° 7′ S, 55° 29′ E) is slightly west of centre and approximately 25 km from the southwest coast. It is from the west and southwest coasts that most Barau's Petrels apparently leave the sea en route to their inland nesting grounds (Jouanin & Gill 1967). The contoured map (Fig. 1) indicates the large size of the walls of the Cirque, which become steeper with altitude so that cliffs up to 800 m in height drop down from the major summits such as the Piton des Neiges. The height of the woodland canopy is about 10 m at 1000 m decreasing to 4 m at 2400 m and then low scrub, with the steepest cliffs bare.

Map of the Cirque de Cilaos, Réunion, showing sites (1–6) from which Barau's Petrels *Pterodroma baraui* were observed during January 1974.

During the observation period the daily weather cycle was well-marked and fairly constant. Following a clear night and dawn, cloud built up from 10.00 (all times refer to local time) and, during the afternoon, virtually all areas between 1800 m and 3000 m were in cloud. In the late afternoon strong air currents flowed up the walls off the Cirque so that by 20.30, in the afterglow period, the Cirque and surrounding mountains were once more clear of cloud except for occasional patches below 2000 m which dispersed during the night. I am informed (in litt.) by the *Ingenieur en Chef de la Meteorologie* at the *Ministere des Transports*, St. Denis, that such a pattern is characteristic of non-cyclonic periods on Réunion.

Observations were made on 9 consecutive evenings, once throughout the night and on 4 mornings (Table 1). Sunrise and sunset were at about 06.40 and 20.10 respectively. At the eastern side of the Cirque, where most watches were done, there was complete darkness from about 20.45 to 06.15.

TABLE 1

Details of observations on Barau's Petrel *Pterodroma baraui* in the Cirque de Cilaos, Réunion, during January 1974

Date	*Site (Altitude, m)*	*Period of observation*	*P. baraui first seen (evening only)*	*Total no. seen (minimum estimate)*	*P. baraui last heard (morning only)*
15 Jan.	1 (1450)	18.00–20.05	19.10	30	
16	1	06.20–07.00			None heard
16	1	18.30–20.15	18.30	70	
17	2 (2600)	17.30–20.15	18.00	50	
18	2	05.15–06.15			06.05
18	2	17.15–21.15	18.30	120	
19	3 (2900)	17.30–20.00	19.15	5	
19	2	20.30–20.45	—	30	
20	2	18.00–22.45	19.25	50	
20/21		Then for 5 mins at approx. hourly intervals through night, until dawn			*
21	4 (1950)	18.10–20.25	18.45	100	
22	5 (2080)	18.00–21.00	18.40	25	
23	5	04.30			
23	5	05.30–06.30			06.20
23	6 (1200)	18.30–20.40	18.45	25	

*No time is given here since wind (see text) greatly obscured calling.

Observations

Observations were made mostly from the east side of the Cirque, and a few from the Col du Taibit (Site 5), which are mentioned separately. The first petrels of the evening appeared well before dusk (Table 1), as recorded in November by Jouanin & Gill (1967). Those seen from Sites 1 and 6 were directly overhead and usually flying in the direction of the Piton des Neiges at an estimated altitude of 1800–2000 m. It was not possible to be certain from which direction they arrived since most were seen only briefly through a temporary break in the clouds. At 2000 m the greatest activity occurred around 19.00, after which the greatest activity was at increasing altitude. To gain height the petrels circled like a raptor, several wing-beats alternating with gliding, exploiting the air currents sweeping up the sides of the Cirque. The strength of these currents could only be estimated by watching the rate at which a cloud boundary moved up the side of the Cirque and by 'feeling' the strength of the wind. I estimated that the vertical component of these currents might be 15 km/hr^{-1}.

At 20.15 Barau's Petrels were seen and heard to be concentrated between 2400 m and 2700 m, and the watches at Sites 4 and 5 established that none was calling below 2000 m. This was the period of greatest activity, with up to 70 birds visible simultaneously silhouetted against the sky over the ridge running southwestwards from the Piton des Neiges. The number of petrels I saw was therefore somewhat larger than the number recorded by Jouanin & Gill (1967). Other petrels, possibly a similar number, were audible between the ridge and Site 2, but being close to the cliff were rarely visible in the fading light and none was ever seen to land on the cliffs. After 20.15 no petrels were heard immediately to the south of Site 2. However the regularity

with which 50 or more gathered over the southwestern ridge of the Piton suggests that this area holds a breeding colony. Possible nesting sites would be the vegetated ledges on the cliffs immediately to the southwest of the Piton. Such sites would be secure from the feral rats and cats present in the area.

Some petrels were seen flying beyond the west ridge towards the Gros Morne where there are also large cliffs. During the evening watch at Site 5 (Col du Taibit) the cloud did not clear until after dark but the intensity of calling was similar to that heard from Site 2 and the large cliffs of the Grand Benard may hold a breeding colony.

From about 20.45 the amount of calling declined steadily. On 20 January when observation stopped at 22.45 the last call was heard at 22.15 and the last bird flew overhead at 22.25. There is apparently little, if any, calling through the middle hours of darkness. It was unfortunate that during the overnight watch, 20–21 January, a fresh southeast wind sprang up after midnight which would have drowned faint calls. However no calling was heard at 04.30 on 23 January. Calling recurred from 05.15 or somewhat before, intensifying until 05.45–06.00, at which time some petrels were flying. As in the evening, calling was most intense around 2500 m. Calling subsided rapidly and was finished by about 06.15, after which time no petrels were seen or heard.

Discussion

This account of inland activity agrees reasonably with observations at the coast in November (Jouanin & Gill 1967, A. S. Cheke pers. comm.). Birds began to fly inland from the coast at about 16.30 and continued to do so in an ever-increasing stream until, at about 19.00, it was too dark to see. Thus the last birds seen leaving the coast before dark would be arriving at the presumed colony at the times inland observations suggest, although there is no knowing whether the flow of petrels continues inland after dark. Some petrels near the coast circled to gain height like those climbing the Cirque de Cilaos. There are no dawn observations at the coast.

Barau's Petrel is unusual among *Pterodroma* species in combining high altitude nesting with a crepuscular pattern of activity at the colony. The altitude of the presumed breeding colonies on Réunion is around 2500 m, although former colonies may have been somewhat lower (see Jouanin & Gill 1967 for historical details), and it nests at only 320 m on Rodrigues (A. S. Cheke pers. comm.). By arriving inland well before dark, Barau's Petrel is able to circle in the air currents sweeping up the sides of the Cirque de Cilaos and thus reduce the energy cost of the ascent to the colony. These currents are at their strongest as the light fades in the early evening. Estimates were made of the possible energy saving between the two extreme instances

(i) where all climbing is done in up-currents with wings held in place by tonic muscles and all horizontal distance from the coast to the presumed colony is covered by downhill gliding; and

(ii) where all climbing and horizontal progress is achieved by powered flight at the minimum power speed.

The following constants are assumed; mass 400 gm (unpublished data on adult *P. arminjoniana* and juvenile *P. baraui* provided by A. S. Cheke), wing

span 0·9 m (Greenewalt 1962, Jouanin & Gill 1967), lift/drag ratio of 20:1 (*cf.* 24·1 in albatrosses—Pennycuick 1972) and gliding speed 15 m/sec^{-1} (Pennycuick 1969). The horizontal and vertical distances to be covered are 25 km and 2·5 km respectively and the rate of climb achieved when soaring is taken to be 150 m/min^{-1}. Basal metabolism was worked out from formulae given in Marshall (1961). Using the aerodynamic assumptions and equations of Pennycuick (1969, 1972) the total energy expended in reaching the colony from the coast in the two situations is (i) 12 KJ and (ii) 135 KJ. The latter figure does not include basal metabolism since excess heat from the flight muscles is probably available during powered flight. Assuming 1 gm of fat yields 38 KJ of energy, then the fat equivalent utilised in the first situation is 0·32 gm and is 3·6 gm in the second. Since the two calculations estimate the extremes of energy required to reach the colony, in practice energy expenditure is likely to be between the two. Nevertheless, the saving due to gliding, when compounded over the many journeys made to the colony during a breeding season, appears large enough to favour the late afternoon arrival at the colony, when up currents are maximum, if this does not conflict with other demands on the birds' time.

The dusk arrival of Barau's Petrels could have a further advantage if, as has been suggested for other tubinares, particularly those feeding on squid, Barau's Petrel feeds either by night or immediately before dawn (Murphy 1936, Ashmole & Ashmole 1967, Imber 1973). After displaying at dusk, non-breeding birds would have time to travel a considerable distance to sea and feed during what may be the optimal period. Breeding adults may possibly remain paired in their burrows overnight and the departure of one bird of the pair would then account for the short period of pre-dawn calling, when the intensity of calling is much lower than at dusk. Warham (1956) noted that in the Great-winged Petrel *Pterodroma macroptera* members of the pair usually stay together for several hours during incubation changeovers, as do some Trindade Petrel *P. arminjoniana* pairs at Round Island (A. S. Cheke pers. comm.). In mid-January most pairs of Barau's Petrel are likely to be incubating and may behave similarly.

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References:

Ashmole, N. P. & Ashmole, M. J. 1967. Comparative feeding ecology of seabirds of a tropical oceanic island. *Peabody Mus. Nat. Hist. Bull.* no. 24.

Cheke, A. S. 1974. Unpublished report on Rodrigues. Mascarene Islands Expedition, British Ornithologists' Union.

Greenewalt, C. H. 1962. Dimensional relationships for flying animals. *Smithson. Misc. Collns.* 144, no. 2.

Imber, M. J. 1973. The food of Grey-faced Petrels (*Pterodroma macroptera gouldi* (Hutton) with special reference to diurnal vertical migration of their prey. *J. Anim. Ecol.* 42: 645–667.

Jouanin, C. 1963. Un petrel nouveau de la Reunion, *Bulweria baraui. Bull. Mus. Hist. Nat. Paris* (2) 35: 593–597.

Jouanin, C. & Gill, F. B. 1967. Recherche du petrel de Barau *Pterodroma baraui. L'Oiseau* 37: 1–19.

Marshall, A. J. (ed.) 1961. *The Biology and Comparative Physiology of Birds*. London and New York: Academic Press, 2 vols.
Murphy, R. C. 1936. *Oceanic Birds of South America*. New York: Amer. Mus. Nat. Hist. 2 vols.
Pennycuick, C. J. 1969. The mechanics of bird migration. *Ibis* 111: 525–556.
— 1972. *Animal Flight*. London: Edward Arnold.
Warham, J. 1956. The breeding of the Great-winged Petrel *Pterodroma macroptera*. *Ibis* 98: 171–185.

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The Cambridge collection of Fijian and Tongan landbirds

by Dick Watling

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In the Cambridge University Zoology Museum there is a little known collection of 140 skins of 42 species or subspecies of Fijian and Tongan landbirds, containing several very interesting skins. The collection has been undeservedly overlooked, probably because its existence has not been the subject of any published report. The majority of the skins were collected by Baron Anatole von Hügel, the renowned anthropologist, in 1875, material being obtained from most of the main islands. The other major contributor was L. Wiglesworth, who collected at the turn of the century. J. Lister collected most of the Tongan skins in 1889.

Von Hügel's most significant contribution was the skin of the Barred Rail *Nesoclopeus poecilopterus*, which he collected on Ovalau, a small island close to Viti Levu, although he did most of his ornitholological work on the latter island. The species has not been positively recorded this century, although possibly re-sighted in 1973 (Holyoak, in prep.). The introduction of the Mongoose *Herpestes auropunctatus* in 1883 has been responsible for the present demise of ground-living birds on the islands of Viti Levu and Vanua Levu where it is at present established. Von Hügel recorded on the label of *N. poecilopterus* 'scarce, very difficult to procure', indicating that it might already have been uncommon prior to the introduction of the mongoose; whereas Layard (1875) described it as '. . . generally distributed'. Von Hügel collected specimens of two other rails, but surprisingly not *Gallirallus phillipensis sethsmithi*, which is the most widespread of the rails in Fiji today. In 1901, Wiglesworth procured no rails at all.

Von Hügel collected two specimens of *Vitia ruficapilla ruficapilla* from the island of Kadavu, which C. W. Benson considers are possibly type material. Another interesting specimen from Kadavu is the Fiji Shrikebill *Clytorhynchus vitiensis compressirostris*, an isolated form slightly larger than other subspecies. There is also a single specimen of the rarely collected form *C. v. heinii* from Tongatapu, Tonga.

Both von Hügel and Wiglesworth collected several specimens of the Red-breasted Musk Parrot *Prosopeia tabuensis splendens* from several localities on Viti Levu, suggesting that it was then widespread and common there. This parrot was an aboriginal or early post-European introduction to Viti Levu from the island of Kadavu, where this form is endemic. Initially it

must have thrived in its new environment, despite competition from its closely related ecological counterpart, the Yellow-breasted Musk Parrot *Prosopeia personata*, which is confined to Viti Levu. However, *P. tabuensis* has since become rare on Viti Levu and is now confined to only a few localities on the forested windward side of the island. *P. personata*, the indigenous species, on the other hand remains common in all suitable habitats (pers. obs.). The nominate *P. t. tabuensis*, which is native to the island of Gau, was an aboriginal introduction to the islands of Eua and Tongatapu in the Tonga group, where the type specimen was collected by Captain Cook. It has managed to survive on the larger island of Eua, where there still remains suitable habitat, but it is extinct on Tongatapu, which is now devoid of natural vegetation. These introductions have provided an interesting experiment in the ecological separation of closely related species. On Viti Levu, where an ecological counterpart was present, *P. tabuensis* has not established itself successfully in the long term. This is apparently despite an initial period when it was possibly common. However on Eua in the absence of an ecological counterpart it has thrived.

The deliberate introduction of these two populations is also of interest. It is well known that until comparatively recently Pacific Islanders prized red feathers for ceremonial, prestigious or religious garments. This was especially so of Polynesians, but is also documented for some Melanesian Societies (Harrisson 1937). It is known, for instance, that Tongans and Samoans, who have no large bird species with red feathers, regularly sailed to Fiji to trade for those from *P. tabuensis* and also for the scarlet feathers of the Collared Lory *Phigys solitarius*. This trade stopped under the direction of Sir E. im Thurn, Governor of the Colony from 1904–11. It would seem probable that the Tongans, who were often the middlemen in the trade (Derrick 1951), deliberately introduced *P. tabuensis* to Eua and Tongatapu, to avoid or reduce trade with the Fijians, which was not always peaceful (Beaglehole 1965). Furthermore, the Tongans have been recorded as having transported live birds on occasions (Sclater 1876). It is unlikely that these weak flying parrots could have crossed the 800 kms to Tonga in the face of the Southeast Trades which blow for most of the year.

Neither von Hügel nor Wiglesworth collected any of the less common forest species such as the Blue-crested Broadbill *Myiagra azureocapilla*, the Black-faced Shrikebill *Clytorhynchus nigrogularis*, the Pink-billed Parrotfinch *Erythrura kleinschmidti* or the Red-throated Lorikeet *Charmosyna amabilis*. Von Hügel was primarily an anthropologist, but it is somewhat surprising that Wiglesworth did not procure any of them, although the first two are by no means uncommon.

TABLE 1

The Cambridge collection of Fijian and Tongan landbirds. In the right-hand column localities on the same island are separated by commas and immediately followed by the island name in brackets, and this is separated from localities on another island by a colon. Fijian orthography for place names in Fiji is used throughout.

Species/subspecies	*Age* and *Sex* ♂♂	♀♀	*Juv.*	?	*Localities collected*
Demigretta sacra		2		3	Navua R. (2), Rakiraki (1) (Viti Levu): Tongatapu (2)
Butorides striatus diminutus		1			Navua R. (1) (Viti Levu)
Anas superciliosa pelewensis	1	1			Tongatapu

Species/subspecies	*Age* and *Sex* ♂♂	♀♀	*Juv.*	*?*	*Localities collected*
Accipiter rufitorques	1	2	1		Rewa R. (1), Wainimala (1) (Viti Levu): Ovalau (1): One unknown
Circus approximans approximans				1	Navua R. (Viti Levu):
Nesoclopeus poecilopterus	1				Draiba (Ovalau)
Porzana tabuensis tabuensis	2				Nakorovatu (2) (Viti Levu)
Poliolimnas cinereus tannensis	1				Viti Levu
Ptilinopus porphyraceus porphyraceus	7	1		3	Makogai (1): Eua (2), Tongatapu (8)
Ptilinopus perousii mariae		1			Viti Levu
Chrysoenas victor	1			1	Taveuni
Chrysoenas viridis	1				Kadavu
Chrysoenas luteovirens	3	1		2	Nadrau (2), Wainimala (1), Viti Levu (1) (Viti Levu): Ovalau (1): Fiji Islands (1)
Ducula latrans	1	2			Rewa R. (1), Nagarawai (1) (Viti Levu): Ovalau (1)
Columba vitiensis vitiensis		1			Levuka (1) (Ovalau)
Gallicolumba stairii	1				Makogai
Phigys solitarius	3	3		1	Suva (2), Rewa R. (1), Nameka (1) (Viti Levu): Moturiki (1): 2 unknown
Prosopeia personata	2	3		1	Rewa R. (2), Navua R. (1), Nadarivatu (1), Viti Levu (2) (Viti Levu)
Prosopeia tabuensis splendens	2	1		3	Rewa R. (2), Namseka (1), Central Viti Levu (1) (Viti Levu): Fiji Islands (1): One unknown
Prosepeia tabuensis tabuensis	1	1			Eua (2)
Cacomantis pyrrophanus simus		1			Suva (Viti Levu)
Collocalia spodiopygia assimilis				1	Rewa R. (Viti Levu)
Halcyon chloris vitiensis	3	2		1	Rewa R. (1), Suva (1), Nadarivatu (1) (Viti Levu): Ovalau (2): Makogai (1)
Lalage maculosa pumila		3		2	Suva (2), Rewa R. (3) (Viti Levu)
Turdus poliocephalus layardi				1	Fiji Islands
Vitia ruficapilla ruficapilla				2	Kadavu
Rhipidura spilodera layardi	1				Nadarivatu (Viti Levu)
Mayrornis lessoni lessoni	3				Suva (2) (Viti Levu): Ovalau (1)
Myiagra vanikorensis rufiventris	3	3		1	Suva (4) (Viti Levu): Ovalau (3)
Clytorhynchus vitiensis compressirostris		1			Kadavu
Clytorhynchus vitiensis vitiensis	2			2	Rewa R. (1) (Viti Levu): Ovalau (1): Fiji Islands (2)
Clytorhynchus vitiensis heinei				1	Tongatapu
Petroica multicolor pusilla	3	1	1		Nadarivatu (3), Wainimala R. (1) (Viti Levu): Ovalau (1)
Pachycephala pectoralis graeffii	2			1	Nadarivatu (2), Wainimala R. (1) (Viti Levu)
Artamus leucorhynchus mentalis	1			2	Suva (1), Rewa R. (1), Wainimala R. (1) (Viti Levu)
Aplonis tabuensis vitiensis	4	2			Nimuka (1) (Viti Levu): Ovalau (5)
Myzomela jugularis	1	8		4	Suva (2), Nadarivatu (2) (Viti Levu): Levuka (9) (Ovalau)
Foulehaio carunculata procerior	5	1			Suva (2), Nadarivatu (1), Wainividrau (1), Viti Levu (1) (Viti Levu): Ovalau (1)
Gymnomyza viridis brunneirostris	1				Nadarivatu (Viti Levu)
Zosterops explorator				1	Rewa R. (Viti Levu)
Zosterops lateralis flaviceps	2	1			Rewa R. (2), Suva (1) (Viti Levu)
Erythrura pealii	1	1			Rewa R. (2) (Viti Levu)

References:
Beaglehole, J. C. 1965–74. The Journals of Captain James Cook on his Voyages of Discovery. Hakluyt Soc. Extra Series 34 (3): 117, 164, 958.
Derrick, R. A. 1951. *The Fiji Islands.* Govt. Press: Suva.
Holyoak, D. T. (In prep.) *Notes on the Birds of Viti Levu and Taveuni, Fiji Islands.*
Harrisson, T. 1937. *Savage Civilization.* Victor Gollancz Ltd: London.
Layard, E. L. 1875. Notes on Fijian birds. *Proc. Zool. Soc. Lond.* 1875: 423–442.
Sclater, P. L. 1876. Exhibition of, and remarks upon, a series of skins of the Parrots of the Fiji Islands, obtained by Mr E. L. Layard. *Proc. Zool. Soc. Lond.* 1876: 307–308.

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A female specimen of *Gallicolumba jobiensis* from San Christoval, Solomon Islands

by D. T. Holyoak

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Gallicolumba jobiensis is widespread in New Guinea and the Bismarck Archipelago (Mayr 1941, Rand & Gilliard 1967). Females of these populations resemble males in the general pattern of coloration, although they are somewhat duller and darker (Goodwin 1967, Rand & Gilliard 1967). Goodwin mentions that he has seen a few specimens said to be females that were of typical male colour but he suspected that these might have been wrongly sexed by the collector.

Mayr (1935, 1936) described a specimen from Vella Lavella in the Solomon Islands as *Gallicolumba jobiensis chalconota.* The type is an adult male that differs from males of the nominate form in having a slightly heavier bill, less white on the lores and the purple on the upperparts less extensive. Besides the type (which is housed in the American Museum of Natural History) three other Solomon Islands specimens of *G. jobiensis* are known: two immature males from Guadalcanal collected by C. M. Woodford that are now housed in the British Museum (Natural History) and Merseyside County Museums, Liverpool (Tristram 1889: 269; Salvadori 1893: 599; Mayr 1936) and an adult female that was originally identified as *Phlogœnas johannæ* Sclater (Tristram 1879) which is also in the Liverpool Collection.

The female specimen in Liverpool (Tristram Collection no. 9864) has been widely overlooked. It is labelled '♀ iris black, feet dark plum, beak black, food berries, seeds, etc., Makira Hr., Solomons, G.E.R.', indicating that it was collected by Lieut. G. E. Richards R.N. on San Christoval, as mentioned by Tristram (1879). This specimen is the only record of the species from San Christoval and the only known female of the species from the Solomon Islands. That it is correctly labelled as a female (and not a wrongly determined immature male) and that it is adult is suggested by the presence of a few moulting body feathers, by the condition of the dried bill and feet and the different coloration from that of the immature males in the B.M. (N.H.) and Liverpool. It closely resembles the three male specimens of *G. j. chalconota* in structure and size (wing 142, tail 89, exposed culmen 16, tarsus 26 mm). However, its coloration is entirely different from that of the adult male type specimen, resembling the two immature males in its generally drab appearance while differing from them in lacking rufous tips to the mantle feathers, scapulars and some wing-coverts and in having a strong green wash on the back, rump and scapulars:

Top and sides of head blackish-brown with narrow and indistinct grey supercilium; mantle very dark bronze-brown with dark olive-green feather tips; back, scapulars and rump very dark green with blackish-brown feather bases; upper tail-coverts very dark bronze-brown with blackish-brown feather bases; rectrices blackish-brown with slightly lighter tips to outer feathers; primaries and primary-coverts blackish-brown with lighter fringes to outer webs of primaries; secondaries blackish-brown with dark olive-green wash on outer webs of inner feathers; chin buff; throat and breast dull grey with broad brown feather tips; belly and flanks dull brown with grey feather bases; under tail-coverts dark grey; under wing-coverts dark brown.

The marked difference in coloration from females of *G. jobiensis* might suggest that *chalconota* should be regarded as a distinct species. However, Amadon (1943) found that adult females of the closely related *G. stairii* are dimorphic: one morph resembling the adult male plumage while the other is generally drab and brownish. A similar situation could exist with *chalconota*, or the Liverpool female specimen could represent an aberrant individual or an undescribed subspecies. Additional specimens are needed for proper assessment of the status of the San Christoval population and of *chalconota*, but recent field workers in the region have not seen the species (Galbraith & Galbraith 1962).

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References:

Amadon, D. 1943. Birds collected during the Whitney South Sea Expedition. 52. *Am. Mus. Novit.* 1237: 19–22.
Galbraith, I. C. J. & Galbraith, E. H. 1962. Land birds of Guadalcanal and the San Christoval Group, Eastern Solomon Islands. *Bull. Br. Mus. (Nat. Hist.), Zool. Ser.* 9: 1–86.
Goodwin, D. 1967. *Pigeons and Doves of the World*. London: Br. Mus. (Nat. Hist.).
Mayr, E. 1935. Birds collected during the Whitney South Sea Expedition. XXX. Descriptions of twenty-five new species and subspecies. *Am. Mus. Novit.* 820: 2.
— 1936. Birds collected during the Whitney South Sea Expedition. XXXI. Descriptions of twenty-five species and subspecies. *Am. Mus. Novit.* 828: 4–5.
— 1941. *List of New Guinea Birds*. New York: Am. Mus. Nat. Hist.
Rand, A. L. & Gilliard, E. T. 1967. *Handbook of New Guinea Birds*. London: Weidenfeld & Nicolson.
Salvadori, T. 1893. *Catalogue of the Birds in the British Museum*. London: Br. Mus. 21: 599.
Tristram, H. B. 1879. On a collection of birds from the Solomon Islands and New Hebrides. *Ibis* 4th ser., 3: 437–444.
— 1889. *Catalogue of a Collection of Birds belonging to H. B. Tristram D.D., LL.D., F.R.S.* Durham: printed at the 'Advertiser' Office.

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The birds of Alacran Reef, Gulf of Mexico

by Jeffery Boswall

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This paper presents observations made during a three-week visit to Arrecife Alacran in the Gulf of Mexico, from the end of August into September 1975, and brings together all other published information on the birds of the reef.

Alacran Reef, 22° 30′ N, 89° 42′ W, lies *c.* 137 km north of the port of Progreso, Yucatan, Mexico, and *c.* 805 km south of the coast of Louisiana, and its islands are among the few offshore islands in the Gulf of Mexico that lie more than *c.* 40 km from the coast (Fig. 1). The only others are the well-known Dry Tortugas in the eastern part of the Gulf, and those to the west

Fig. 1. Off-shore islands of the Gulf of Mexico. (Drawn by Robin Prytherch)

that share the Campeche Bank with Alacran, namely, Cayo Arenas, Arrecifes Triangulos (Oeste, Este and Sur) and Cayos Arcas. Cayo Neuvo, 21° 50′ N, 92° 04′ W, listed by Lowery & Newman (1954) as an offshore island that might provide nesting sites for birds, is not included by Paynter (1953) in his list of Campeche Bank islands. It appears on the hydrographic chart (Barnett 1848) as a bank rather than an island, but it is clear from the pilot (Anon 1941) that there is one cay and two 'above-water sandbanks'. So far as I can ascertain no ornithologist has visited this island. All the Campeche Bank islands lie between 128 km and 160 km offshore, while the Dry Tortugas are 109 km from the nearest land. The Alacran group is the most remote from the mainland and from other islands.

The Alacran Reef is of classical half-moon shape (Fig. 2), *c.* 26 km along its longest axis and *c.* 14 km wide, with its rounded side facing the prevailing northeasterly trade winds. Along the open southwest side of the reef the navigational chart shows 5 islands, each a bank of coral sand, whose outlines vary seasonally with storms and changing wind directions—for example Fosberg (1962) reported that Desterrada had been cut into two islets by a

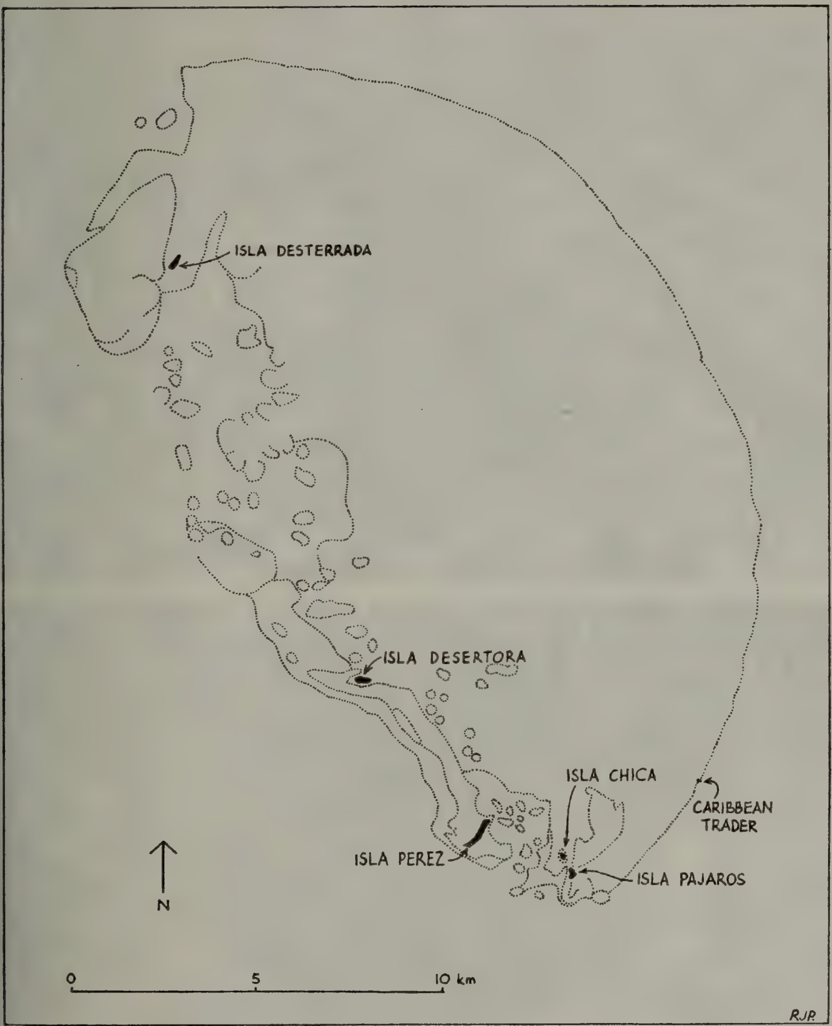

Fig. 2. The Alacran Reef. (Drawn by Robin Prytherch from a hydrographical chart)

storm—so that the dimensions that follow must thus be taken as very approximate. In the north is Isla Desterrada (0·9 km long, 18 ha.) also called Utowane, which I did not visit. In the south is Isla Desertora (0·25 km long, 2 ha.), also known as Allison, and locally as Muertos; a pair of islands Chica (0·18 km long, 1 ha.) and Pajaros (0·2 km long, 1·3 ha.), the latter known locally as Blanca, and Isla Perez (0·95 km long, 13 ha.).

I was resident on Isla Perez from 0900 on 30 August to 1100 hours on 21 September 1975, and I landed on Desertora on 1 and 8 September, and on Chica and Pajaros on 2 September. My visit was not strictly ornithological

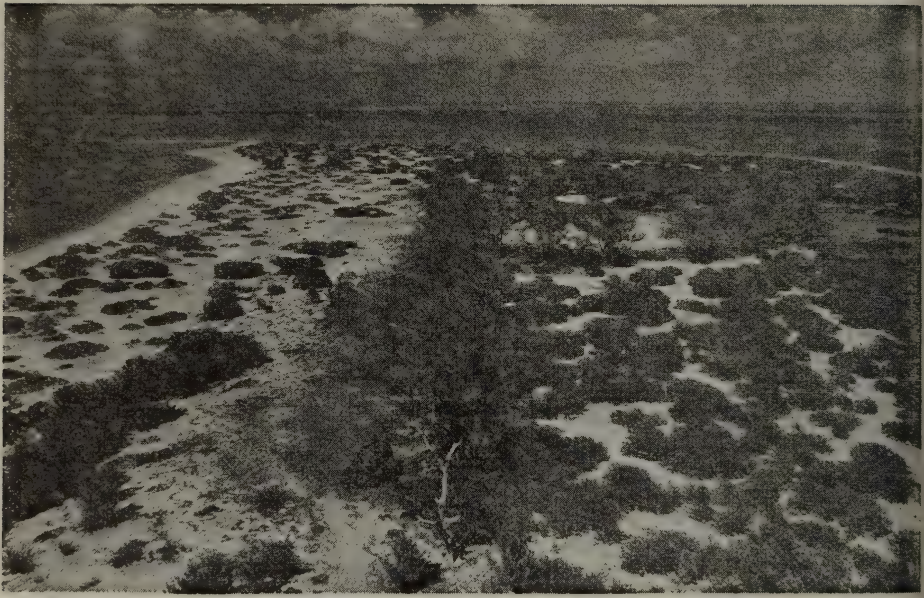

Fig. 3 (above). Perez Island, Alacran Reef, looking NNW from the balcony of the lighthouse.

Fig. 4 (below). Immature Purple Gallinule *Porphyrula martinica* consuming the fruit of a Prickly Pear (*Opuntia* sp.), Perez Island, Alacran Reef, 20 September 1975.

and my opportunity for making observations varied considerably from day to day. In particular I was not able to make and relate daily observations of migrants with the weather.

Perez is the only inhabited island, having a population of two lighthouse keepers and two members of the Mexican Marines. It is the largest of the southern islands and the most vegetated of the four I visited, having one species of conifer (the Australian pine *Casuarina* sp.), 2 of ornamental deciduous trees, 2 species of mangrove, and one species (the prickly pear *Opuntia* sp.) of cactus. The island also boasts large areas of low shrubs, and a number of sand-loving plants, e.g. sea lavender *Limonium* sp. The pines are said to have been planted 60 years ago, the tallest being at least 20 m (see Fig. 3). The other 3 southern Alacran islands have an impoverished flora, no plant growing taller than *c.* 1 m.

The vegetation of the 4 southerly islands was identified and mapped in great detail in 1899 by Millspaugh (1916) but profound changes have taken place according to Fosberg (1962), who gives brief descriptions of the terrestrial flora and describes the climate and physiography.

The only vertebrates seen on Perez besides wild birds and man were two domestic dogs and a small species of lizard. No introduced cats (*Felis* sp.) were present, and I neither saw nor was told of any rats (*Rattus* sp.), though Dampier (1699) reported 'large rats, which are in great bounty'.

There are very few published references to the birds of Alacran. Dampier (1699) spent 2–3 days among the Alacran islands in the late summer of 1675, exactly 300 years before my own visit, and mentions some birds, as also do Smith (1838) and Marion (1884). In mapping the vegetation of 4 of the islands in 1899 Millspaugh (1916) noted nesting seabirds. Kennedy (1917) landed on Pajaros and Chica on 20 May 1912 and wrote specifically about birds, as did Paynter (1953, 1955), who visited the 5 Alacran islands 1–3 September 1952. Siebenaler (1954 and *in* Paynter 1955) visited Isla Desterrada on 6 October 1952. An expedition in July 1959 (Kornicker *et al.* 1959) listed the breeding birds of the islands, as well as the marine invertebrates, and produced the best available map (see also Kornicker & Boyd 1962). A visit in July 1961 (Fosberg 1962), was mainly to study the physiography and botany. Summarising the scientific work done at Alacran 1955–1961, Anon (1963) describes Alacran as one of the world's best known atolls. Such, however, is not true of its birds.

SYSTEMATIC LIST

All my observations refer to Isla Perez unless otherwise specified.

BLUE-FACED BOOBY *Sula dactylatra*. About 2,000 present on Isla Desertora, 1 and 8 Sep., adults outnumbering young by 3–4:1. All but a dozen young birds could fly; only one nestling was still completely covered in down. A few fully-feathered young were seen being fed fish by adults. On Pajaros I found 21 adults and one full-grown but flightless young. Dampier (1699) reported boobies in great abundance in 1675 but 'only on some of the northernmost' of the '5 or 6 low sandy islets'. He was probably referring to the Blue-faced Booby, as may have been Smith (1838) who said 'All the cays swarm with boobies', and Marion (1884) who found boobies nesting on Isla Pajaros. Millspaugh (1916) photographed this species on its nest at Alacran in March 1899; he found the birds nesting on Desertora as well, and implies that they were also breeding on Pajaros and Chica, where Kennedy (1917) certainly found them nesting in May 1912. Kennedy also records 2 'great downy youngsters on Pajaros, and some fifty pairs with very small young, or eggs' on Chica. Between 1–3 Sep. 1952 Paynter (1955) found 200 individuals on Pajaros, where nesting had already been completed.

Brown Booby *Sula leucogaster*. Single immatures, 12 and 17 Sep. 4 adults and 2 young seen resting on the wreck of the ship 'Caribbean Trader' 13 Sep. According to the lighthouse keeper, thousands nest on Isla Desterrada. Paynter (1955) recorded c.500 resting on an islet off Isla Pajaros, and 300 on Isla Desterrada in early Sep. 1952 and was told by lighthouse keepers that it nested on both these islands. Siebenaler (1954) recorded it near Desterrada, 5 Oct. 1952. Kornicker *et al.* (1959) list it without detail as one of 7 seabirds nesting at Alacran.

Magnificent Frigatebird *Fregata magnificens*. Seen daily in varying numbers, maximum 500 at Isla Desertora, 1 Sep., where a large but partly downy nestling was found on 8 Sep., near 48 empty nests in low shrubbery. About 100 regularly rested on the wreck of the 'Caribbean Trader'. According to the lighthouse keeper it nests also on Isla Desterrada. Dampier (1699) found 'Men of War Birds' nesting at Alacran, colourfully describing their piratical behaviour. Smith (1838) mentions the species in passing and Millspaugh (1916) put up a cloud of frigates from Desertora and found their nests there. Kennedy (1917) flushed several from Pajaros but did not think they were nesting. In early Sep. 1952 Paynter (1955) found on Isla Desterrada many occupied nests but few eggs; and a month later J. B. Siebenaler (*in* Paynter 1955) estimated 2,500 nests with eggs there.

Great Blue Heron *Ardea herodias*. An immature near Isla Chica on 6 Sep.

Green Heron *Butorides striatus*. Singles on 5, 11, 12, 17 and 18 Sep., 5 on 6th, 40 on 14th and 16 on 15 Sep. Paynter (1953) saw c. 10 between 1 and 3 Sep., 1952.

Cattle Egret *Bubulcus ibis*. One adult on 31 Aug., one young bird on 1 Sep., one adult and 2 young on 2nd, one young on 7th, 8 adults on 16th, one adult on 18th and 2 adults on 19 Sep. Paynter (1955) knew of no records for Yucatan.

Black-crowned Night Heron *Nycticorax nycticorax*. One adult, 15 Sep. Not recorded in Yucatan by Paynter (1955).

Yellow-crowned Night Heron *Nyctanassa violacea*. A single immature, almost certainly the same individual, was seen 1, 10, 16, 17, 18 and 19 Sep. Paynter (1953) saw one between 1 and 3 Sep., 1952.

Least Bittern *Ixobrychus exilis*. One female or immature found on the ground in convulsions, 5 Sep., died within 10 minutes: there was no external sign of injury except a tiny ooze of blood from one nostril. Weight 55·0 gm. Three males given by Palmer (1962) weighed 45·0–85·3 gm. Paynter (1955) knew of only one previous record for Yucatan.

Sharp-shinned Hawk *Accipiter striatus*. Siebenaler (1954) saw one near Desterrada on 5 Oct. 1952.

Purple Gallinule *Porphyrula martinica*. An immature was rummaging in the lighthouse keeper's open air kitchen on 18 Sep. Very tame, it took scraps of food from a bowl, even stepped into a basin of water for a bath. It was still present on 19 and 20 Sep. It persistently fed on the ripe red fruit of a prickly pear cactus (Fig. 4).

Black-bellied Plover *Pluvialis squatarola*. Totals for the 4 islands were: in Aug., 3 on 31st, in Sep., one on 1st, 6 on 2nd, one on 8th, 2 on 10th, 3 on 16th, 5 on 18th, one on 19th and 3 on 20th. Paynter (1953) recorded 5 between 1 and 3 Sep., 1952.

Ruddy Turnstone *Arenaria interpres*. Up to 25 daily on Isla Perez, often feeding inland among bushes or in areas of dry coral sand, and in small numbers on the other islands. Paynter (1953) saw about 50 between 1 and 3 Sep. 1952, and Siebenaler (1954) one near Desterrada on 5 Oct. 1952.

Common Snipe *Gallinago gallinago*. Six flushed from among bushes, 20 Sep.

Spotted Sandpiper *Actitis macularia*. One, 31 Aug.

Willet *Catoptrophorus semipalmatus*. One on 1 Sep., 2 next day and one on 20 Sep.

Greater Yellowlegs *Tringa melanoleuca*. Two seen and heard on 2 Sep., one on 8 Sep.

Lesser Yellowlegs *Tringa flavipes*. One on 17, 18, 19 and 20 Sep.

Calidris sp. Two black-legged sandpipers on 31 Aug., 2 on 17 Sep. and one on 20 Sep. were almost certainly Semi-palmated Sandpipers *C. pusilla*.

Sanderling *Calidris alba*. Up to 10 daily on Isla Perez and also seen on the other islands. Paynter (1953) saw 5 between 1 and 3 Sep. 1952.

White-rumped Sandpiper *Calidris fuscicollis*. Kennedy (1917) shot 2 on Isla Pajaros 20 May 1912, misidentifying them as Baird's Sandpiper *Calidris bairdii* (Lowery & Newman 1954).

LEAST SANDPIPER *Calidris minutilla.* Seven on 31 Aug., 11 on 1 Sep., 8 on 16th, 11 on 17th, 4 on 18th and 20 Sep.

SHORT-BILLED DOWITCHER *Limnodromus griseus.* Six on 31 Aug., 9 on 1 Sep., 5 on 2nd, 9 on 10th and 16th, 10 on 17th, 5 on 18th, 2 on 19th and 11 on 20 Sep.

BLACK-NECKED STILT *Himantopus mexicanus.* Fifteen on 1 Sep. and 7 on 18 Sep.

LAUGHING GULL *Larus atricilla.* I saw no evidence of breeding. Up to *c.* 100 daily, often in attendance near fishing vessels. A small proportion were birds of the year, e.g. 14 out of 94 on 20 Sep. Kennedy (1917) found 4 nests on Pajaros. Paynter (1955) was told by the lighthouse keepers that Laughing Gulls were fairly common nesters throughout the reef.

SOOTY TERN *Sterna fuscata.* Between 12 and 20 daily up to 13 Sep.; thereafter only 1–2 daily. According to the lighthouse keeper, it nests by the thousand. I saw only 2 young birds: one on 1 Sep. barely able to fly, and another with a broken wing but being attended by an anxious adult, 13 Sep. Of the early visitors only Dampier (1699) makes specific reference to terns—presumably his 'Egg-birds' breeding at Alacran meant terns. Kennedy (1917) found a great colony of Sooty Terns nesting on Pajaros. In early Sep. 1952 Paynter (1955) saw only 5 at Alacran, on Isla Perez. He was told that many thousands breed throughout the reef. The eggs of Sooty and Noddy Terns are exported in thousands, probably tens of thousands, each year, being sold in 1975 at the rate of 100 pesos for 500 eggs. The claim is made that no eggs are taken after Easter each year.

ROYAL TERN *Sterna maxima.* Between 30 and 110 daily; I saw no evidence of breeding. Paynter (1955) was told by the lighthouse keepers that they bred May–June. Siebenaler (1954) saw some near Desterrada, 5 Oct. 1952.

SANDWICH TERN *Sterna sandvicensis.* Up to about 20 birds most days up to 17 Sep. I saw no evidence of breeding. Kennedy (1917) found a colony on Pajaros, and Paynter (1955) saw several hundred early Sep. 1952 and was told that the main colony of several hundred birds was on Isla Desterrada.

BLACK TERN *Chlidonias niger.* Three near Isla Desertora, 8 Sep. Paynter (1955) saw c. 50 between 1 and 3 Sep. 1952.

NODDY TERN *Anous stolidus.* About 2,000 adults and young of the year, were present when I arrived, most still occupying nests in shrubs and trees; but they were only a fraction of the total of pairs which the lighthouse keeper said nest on the island. Towards the end of my stay the island would be deserted during the day, and by 21 Sep. numbers were down to several hundred birds. The young birds appeared fully grown and were free flying, but persistently begged from their parents, though no fishing or feeding behaviour was observed in daylight. They were fed at night, judging from fish remains occasionally found in the mornings, as late as 10 Sep. Daytime begging by young terns was much less evident by 21 Sep. Paynter (1955) found a few in early Sep. 1952 on Isla Perez by day, but at nightfall hundreds roosted. He estimated many hundreds of old nests and concluded that well over 1,000 birds must breed on the island. See also under Sooty Tern for notes on the commercial exploitation of eggs.

YELLOW-BILLED CUCKOO *Coccyzus americanus.* Paynter (1953) saw one between 1 and 3 Sep., 1952.

BLACK SKIMMER *Rynchops nigra.* Two together, 18 Sep.

HUMMING-BIRD Trochilidae sp. One briefly seen and heard, 16 Sep.

BELTED KINGFISHER *Megaceryle alcyon.* One on 5 Sep., 2 on 14th and one on 15 Sep. Paynter (1953) saw one between 1 and 3 Sep. 1952.

Unidentified larger small passerines. Birds noticeably larger than wood-warblers were seen as follows: one on 30 Aug., 2, 7, 17 Sep., 2 on 16 Sep.

EASTERN KINGBIRD *Tyrannus tyrannus.* Four on 6 Sep., 2 on 10th, 3 on 14th, singles on 15, 16, 19 Sep., 3 on 18th and 6 on 20 Sep. Paynter (1953) saw c. 15 between 1 and 3 Sep., 1952.

TYRANNIDAE sp. A bird with grey head, white breast, and lemon yellow belly seen on 2 Sep. was almost certainly of the genus *Tyrannus.* Another, with two noticeable wing bars, sulphur yellow underparts and a tail of warm brown, fleetingly observed on 19 Sep. was almost certainly a Great Crested Flycatcher *Myiarchus crinitus.*

EASTERN PHOEBE *Sayornis phoebe.* Singles on 6, 8, 16, 18, 20 and 21 Sep., and 2 on 19 Sep. A bird with a drooping wing caught flies round the lighthouse keeper's open-air kitchen 9–12 Sep. Only one previous record from Yucatan (Paynter 1955).

Eastern Wood Pewee *Contopus virens.* One on 19 Sep.

Bank Swallow *Riparia riparia.* One on 31 Aug., and in Sep. singles on 1, 6, 12, 15, 16 and 17 Sep., 2 on 4 Sep. Paynter (1953) saw 8 between 1 and 3 Sep., 1952.

Barn Swallow *Hirundo rustica.* Numbers were not easy to estimate but 15–50 present daily. All were birds of the year. A few were seen over the other 3 islands and over 'Caribbean Trader', and occasionally over the open sea. Two dead birds were found 31 Aug. and 4 on 2 Sep. One that died in the hand weighed 12 gm. The swallows roosted on the buildings of the island. Paynter (1953) saw c. 200 between 1 and 3 Sep., 1952.

Cliff Swallow *Petrochelidon pyrrhonota.* In September, one on 1 Sep., 2 on 4th, 3 on 6th, and 2 on 17 Sep. One of those seen on 6 Sep. died in the hand and weighed 12 gm. Only 2 previous records from Yucatan (Paynter 1955).

Purple Martin *Progne subis.* Two on 31 Aug., and one on 2nd, 8 on 4th and 5 on 14 Sep. Paynter (1953) saw 5 between 1 and 3 Sep., 1952.

Turdidae sp. A thrush on 18, 19 Sep., well seen from the rear but not the front, was either a *Hylocichla* or a *Catharus.*

Red-eyed Vireo *Vireo olivaceus.* One 3 Sep., and another 19 Sep. Paynter (1953) saw one between 1 and 3 Sep., 1952.

Unidentified medium small passerines. Birds about the size of wood-warblers, were seen as follows: one on 30 and 31 Aug., and in Sep., 5 on 1st, 3 on 2nd, one on 4th, 2 on 6th, one on 10th, one on 13th, one on 14th, 2 on 15th, one on 16th, 3 on 17th, 2 on 18th, one on 19th and 2 on 20th.

Black-and-White Warbler *Mniotilta varia.* A male on 9 Sep., and individuals in female-type plumage were seen as follows: one on 12, 15, 16, 19 and 20 Sep., and 2 on 14 Sep.

Golden-winged Warbler *Vermivora chrysoptera.* Paynter (1953) saw one between 1 and 3 Sep., 1952.

Prothonotary Warbler *Protonotaria citrea.* One on 15 Sep.

Northern Parula *Parula americana.* Three on 31 Aug. and one on 1 Sep. Paynter (1953) saw one between 1 and 3 Sep., 1952.

Yellow Warbler *Dendroica petechia.* Single males on 9, 10 and 13 Sep.

Black-throated Blue Warbler *Dendroica caerulescens.* An adult male on 18, 19 Sep. Only 2 previous records (4 individuals) from Yucatan (Paynter 1955).

Cerulean Warbler *Dendroica cerulea.* Paynter (1953) saw 2 between 1 and 3 Sep., 1952.

Pine Warbler *Dendroica palmarum.* Siebenaler saw one near Desterrada on 5 Oct. 1952.

Ovenbird *Seiurus aurocapillus.* One on 2 Sep., 2 on 14th and one on 17, 18 and 19 Sep. Paynter (1953) saw c. 5 between 1 and 3 Sep. 1952.

Northern Waterthrush *Seiurus noveboracensis.* One on 2 Sep., 2 on 14th, 1 on 17, 18 and 19 Sep.

Kentucky Warbler *Oporornis formosus.* Two on 4 Sep., and one next day.

Hooded Warbler *Wilsonia citrina.* A male on 16 Sep. and a different, apparently moulting male on 18, 19 Sep. Paynter (1953) saw c. 100 between 1 and 3 Sep., 1952.

Wilson's Warbler *Wilsonia pusilla.* One first seen on the evening of 1 Sep. was found dead next morning, weighing 8·0 gm. One on 4 Sep., and an intensely yellow individual on 9, 10 and 12 Sep. Two on 14, 15, 16, 18 Sep; one of those present on 16th and 18th had a well-marked black cap. Not recorded by Paynter (1955) for Yucatan.

American Redstart *Setophaga ruticilla.* Singles, none of them adult males, on 5, 14, 15, 16 and 18 Sep. Paynter (1953) saw c. 5 between 1 and 3 Sep., 1952.

Icterus or *Piranga* spp. Passerines, almost certainly of one or other of these genera, were seen as follows: one on 31 Aug., 1, 9 and 19 Sep., 2 on 6 Sep., and 3 on 12 Sep.

Bobolink *Dolichonyx oryzivorus.* Three on 10, 12, and 14 Sep., one on 16 and 20 Sep.

Northern Oriole *Icterus galbula.* Two *I. g. galbula* on 14 Sep., one a blackish-headed female; 3 on 16 Sep., one an adult male.

Lark Sparrow *Chondestes grammacus.* Singles on 11, 15, 18, 19 and 20 Sep. Only one previous record from Yucatan (Paynter 1955).

Finch-like passerines. Two with heavy bills seen 19 Sep. and one on 20th, were neither Bobolinks nor Lark Sparrows.

DISCUSSION

A number of the small passerines I saw showed signs of weakness—half closed eyes and drooping wings—and a Red-eyed Vireo, for example, can be seen in film (Boswall & Fisher 1976) in this condition. From time to time a number of tired Barn Swallows allowed the observer closely to approach their perches and on 3 occasions, in search of fresh water, perched on the edge of a pail, within a metre or 2 of a human. Occasionally swallows were seen drinking while on the wing at the small brackish lagoon at the south end of the island. Rain, in varying amounts, fell at least every 3–4 days, but it evaporated fast and on days of no precipitation the only fresh water available would have been that derived from insect prey. On 20 Sep. an Eastern Phoebe surprisingly flew from a coastal bush, splashed into the sea, either to drink or bathe, and returned to its perch. A young Purple Gallinule took in moisture with the damp food put out for it, and may also have drunk while bathing.

One Least Bittern, 6 Barn Swallows, one Cliff Swallow and one Wilson's Warbler were found in a dead or dying condition.

Midges appeared to be very common on the island, as were house flies (*Musca* sp.) near the human habitation. More than one Eastern Phoebe appeared to make a satisfactory living near the lighthouse keeper's kitchen, feeding, no doubt, on insects.

The abundance and variety of other insects observed were such as strongly to suggest migratory movement. Seven or 8 species of Lepidoptera were noted, as were 4–5 species of dragonflies (Odonata), one of lacewing (probably of the Order Planipennia), at least one species of grasshopper (Acrididae), and a number of other smaller fly-like unidentified insects. A Black-and White Warbler was seen immobilising an off-white moth, but the extent to which migrant birds generally benefit from migrant insects is a matter for speculation.

In their review of the birds of the Gulf of Mexico, Lowery & Newman (1954) used 3 species-categories: off-shore birds, birds of the coast and land birds over the open Gulf.

At Alacran 4 off-shore species have so far been observed and they all breed there, namely the Brown Booby, Blue-faced Booby, Sooty Tern and Noddy Tern. Four coastal species also breed at Alacran: the Magnificent Frigatebird, Laughing Gull, Royal Tern and Sandwich Tern. Non-breeding coastal species that have occurred at Alacran on migration or as a result of post-nesting dispersal number about 17 species. No land birds are known to have bred at Alacran, but land birds seen on migration total about 36 species. The apparent absence of nesting land birds is probably attributable not only to the island's very small area (Hamilton *et al.* 1964), but also to the paucity of habitats, absence of a reliable water supply and distance from the mainland. The nearest mainland is Yucatan, a peninsula, and thus offering fewer species as colonists than a mass of mainland (MacArthur & Wilson 1967: 115–116).

In regard to migrant land birds, taking the Gulf as a whole, Lowery & Newman (1954), summarising all records up to autumn 1951, had autumn records of only 13 land bird species over the waters of the Gulf at distances of a mile or more from the nearest coast. None was from islands. Paynter's 1952 early autumn cruise round the Campeche Bank added as many as 23

species, Siebenaler (1954) added 11, and my own observations from Isla Perez add a further 9 species. Thus 56 species of land bird have now been seen in autumn either over the open Gulf or on offshore Gulf islands, though in spring 61 species have been seen (Lowery & Newman 1954). Paynter (1953) thought that his observations on the Campeche Bank pointed towards regular autumnal trans-Gulf migration being normal and G. H. Lowery tells me he has many 'data on the arrival in Yucatan in fall of large flights from the open Gulf'. In any case southward migration across the Gulf was never disputed as strongly as spring movements northward (Williams 1945), and it is now clear that nearly all migrants are capable of trans-Gulf migration at either season, though the detailed pattern has yet to be clarified.

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References:

Anon. 1941 *West Indies Pilot.* Vol. 1. Hydrographic Dept., Admiralty: London.

Anon. 1963. Alacran Reef. *Atoll Res. Bull.* 84: 6–9.

Barnett, E. 1848. *Coast of Yucatan and the Campeche Bank.* (Revised 1974.) Hydrographic Office, Admiralty: London.

Boswall, J. & Fisher, D. 1976. *Wildlife Safari to Mexico: to the Scorpion Reef.* One 25 min, 16 mm colour film, BBC, London.

Dampier, W. 1699. *Voyages and Descriptions*, Vol. 2, Pt. 2: *Two Voyages to Campeachy.* James Knapton: London.

Fosberg, F. R. 1962. A brief survey of the cays of Arrecife Alacran, a Mexican atoll. *Atoll Res. Bull.* 93: 15–25.

Hamilton, T. H., Barth, K. & Rubinoff, I. 1964. The environmental control of insular variation in bird species abundance. *Proc. Nat. Acad. Sci. USA.* 52: 132–140.

Kennedy, J. N. 1917. A little-known bird colony in the Gulf of Mexico. *Ibis* Ser. 10 (5): 41–43.

Kornicker, L. S. *et al.* 1959. *Alacran Reef, Campeche Bank, Mexico.* Publ. Inst. Mar. Sci. Univ. Texas 6: 1–22, large scale map.

Kornicker, L. S. & Boyd, D. W. 1962. Shallow-water geology and environments of Alacran Reef complex, Campeche Bank, Mexico. *Bull. Am. Ass. Petroleum Geologists* 46 (5): 640–673.

Lowery, G. H. & Newman, R. J. 1954. *The Birds of the Gulf of Mexico.* In *Gulf of Mexico: its Origin, Waters, and Marine Life.* Fishery Bull. 89, Fishery Bull. Fish and Wildlife Service, Vol. 55: 519–540.

MacArthur, R. H. & Wilson, E. O. 1967. *The Theory of Island Biogeography.* Princeton Univ. Press.

Marion, Dr. 1884. Excursion aux Isles Alacrans. *Soc. Acad. Brest Bull.* 2nd ser. 9: 5–21.

Millspaugh, C. G. 1916. Vegetation of the Alacran Reef. *Field Mus. Nat. Hist.* Pub. 187 Bot. Ser. 2(11): 421–431.

Palmer, R. S. 1962. *Handbook of North American Birds.* Yale Univ. Press: New Haven.

Paynter, R. A. 1953. Autumnal migrants on the Campeche Bank. *Auk* 70: 338–349.

Paynter, R. A. 1955. The ornithogeography of the Yucatan Peninsula. *Peabody Mus. Nat. Hist. Bull.* 9.

Siebenaler, J. B. 1954. Notes on autumnal trans-Gulf migration of Birds. *Condor* 56: 43–48.

Smith, T. 1838. Description of Alacran and Cay Arenas, in the Gulf of Mexico. *Nautical Mag.* 7: 804–805.

Williams, G. 1945. Do birds cross the Gulf of Mexico in spring? *Auk* 62: 98–111.

Postscript:
After the above paper had been typeset, Byrd (*in* Sprunt *et al.* 1978. Nat. Audubon Soc. N.Y.) reported a juvenile Cattle Egret *Bubulcus ibis*, colour ringed in Virginia and recovered at sea in the Gulf of Mexico *c.* 100 km south of the coast of Louisiana in the direction of Yucatan. This observation and my own at Alacran appear to show that at least some Cattle Egrets (a species absent from much of the United States during winter) make direct trans-Gulf flights to Mexico, this being one of 3 possible routes discussed by Byrd.

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A new race of *Pitta oatesi* from Peninsular Malaysia

by Ben King

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In April 1977, I spent six days on Fraser's Hill in the mountains of western Pahang trying to find a pitta that had been reported intermittently over a period of 29 years, but had never been identified.

The first records of a pitta, apparently resident in the Malaysian mountains, are those of Bromley (1952) who saw and heard birds which he thought were Giant Pittas *Pitta caerulea* on Fraser's Hill in August 1948, and heard similar calls at Maxwell's Hill, Perak state, on 29 April 1950. A further sighting, also attributed to *caerulea*, was reported from Fraser's Hill by Allen (1959). At the same locality on 31 May 1969, Graham Madge, David Wells and Ken Scriven tape-recorded calls similar to that described by Bromley. No bird was seen but on the following day near the same spot, Wells saw a brown pitta with green back and shining blue rump. Subsequently Madge saw a similar bird.

I started my search in late afternoon on 3 April by playing a copy of the tape made in 1969 by Ken Scriven. One bird replied. Next morning I walked a trail for about one km and got responses to the tape from 3 different birds. I got only brief shadowy glimpses of 2 birds and saw even less of them on the next 2 days. Finally on the morning of 7 April, I flushed one from a perch about 3 m up in a palm tree. The perch proved to be the pitta's nest. I stayed nearby and recorded various notes of the bird but did not get a look at it on the ground.

I notified Bernard Bond and Julian Perry who arrived that evening. At dawn we set a mist net across the bird's flight route from the nest. Later we flushed the bird into the net and collected the nest with its 2 eggs. The bird proved to be the Rusty-naped Pitta *Pitta oatesi*.

Pitta oatesi is a large pitta (total length 25 cm) found in Burma, Thailand and Indochina. The head and underparts are brownish with a black line behind the eye. The mantle to tail is dull greenish, sometimes with a bluish tinge on the rump. The species is currently divided into 3 subspecies (Mayr, in manuscript): *P. o. oatesi* (Hume 1873), Burma (including Tenasserim), northwestern Thailand and northern Laos; *P. o. castaneiceps* (Delacour & Jabouille 1930), south Yunnan and Vietnam; *P. o. bolovenensis* (Delacour 1932), Bolovens Plateau of southern Laos. I examined 46 specimens from the collections of the American Museum of Natural History and the United States National Museum: 25 of nominate *oatesi*, 16 of *castaneiceps* and 5 of *bolovenensis*. There is considerable individual variation and some sexual dimorphism which appears not to have been described in the literature. My

sample size precluded attempting this task. However, the sample was adequate to show that while the differences between the three known races are adequate to maintain their status as subspecies, those differences are nevertheless small.

The new pitta is separated from the nearest known population of nominate *oatesi* in Tenasserim (Hume & Davison 1878) by at least 650 km. Since *Pitta oatesi* is found from 900–1,800 m elevation, it is likely that a real gap exists in the narrow central part of the Malay Peninsula (i.e. in southern peninsular Thailand) as there are long distances there where the spinal ridge is below 900 m.

The Malaysian bird is similar in pattern to *Pitta oatesi* and obviously related, but differs from the other 3 races in being much darker overall. The Main Range of Peninsular Malaysia is more perennially humid than the rest of the range of *P. oatesi* and this may account for the greater colour saturation. The Malaysian bird's call is seemingly different from the 'melodius *bong-bong*' described by Deignan (1945) for *P. o. oatesi* in northwestern Thailand. Playback experiments in Thailand with the Malaysian tapes may provide some clues. For the present the Malaysian bird is best maintained as a race of *Pitta oatesi* and is named as follows:

Pitta oatesi deborah subsp. nov.

Type: Adult male; British Museum (Natural History) No. 1978.1.1. Fraser's Hill, Ulu Tranum Forest Reserve, Main Range, Pahang, Peninsular Malaysia; 3° 43′ N, 101° 44′ E, elevation approximately 1,200 m; 8 April 1977; collected by Ben King, Bernard Bond and Julian Perry; original number Ben King 2897.

Diagnosis: differs from males of *P. o. oatesi* in its much darker, more rufescent head, nape and sides of neck (dark rufescent brown as opposed to fulvous-brown with a rusty tinge); darker green mantle and upperside of tail (dark grass green, rather than dull green with a coppery tinge, the copper especially strong on the upper wing coverts—some individuals of *oatesi* have a coppery brown mantle with a dull green tinge); more intense, darker, shining blue rump and upper tail coverts (rather than dull green with a slight to strong tinge of paler, sky blue on rump only); lack of black on centre of feathers of mantle (a variable character, often completely missing on *oatesi* and apparently not related to sex); dark green outer webs of secondaries and tertiaries, with a narrow edging of dark buffy brown (rather than dull green with fulvous edging); darker, blacker primaries with narrow fulvous edging on outer web (rather than blackish brown inner web and dark olive-brown outer web); darker, browner underparts with a strong pink suffusion, most feathers broadly tipped pink, grading into the colour of the main part of the feather. The breast of *deborah* is rufescent brown, grading into olive-brown flanks, whitish centre of throat and tawny centre of belly and under tail coverts (males of *oatesi* have fulvous-brown breast and flanks, grading to whitish centre of throat and tawny belly and under tail coverts, the pink tinge faint or absent, and restricted to throat and breast). In common with *P. oatesi*, *deborah* has the dusky loral patch; black band extending behind eye (about 2·5 cm); lengthened, barbless shafts (up to 7 mm beyond feather tip) of the throat feathers; narrow white area at base of primaries underneath; wing lining consisting of rusty brown lesser

and median coverts, rusty buff inner to buffy white outer greater coverts, and blackish primary coverts.

P. o. bolovenensis differs from nominate *oatesi* in its more rufescent head, greener mantle and stronger blue rump and often upper tail coverts and is thus somewhat closer to *deborah*. However, *deborah* is noticeably darker than *bolovenensis* in all these characteristics. Underparts of *bolovenensis* are like *oatesi*. Male *castaneiceps* differs from *oatesi* in being slightly darker in all aspects, but like *bolovenensis* is closer to *oatesi* than *deborah*.

P. o. deborah appears to be somewhat smaller than the other races of *Pitta oatesi*, with an unflattened wing measurement of 107·5 mm (7 males of *oatesi* ranged from 112·6–122·7 mm, mean 116·3 mm; 9 males of *castaneiceps* ranged from 112·7–119·2 mm, mean 117·4 mm; 2 males of *bolovenensis* measured 114·9 mm and 117·2 mm).

Colour of soft parts: Irides dark brown; bill black, narrowly tipped horn; feet brownish flesh; claws horn.

Measurements: Unflattened wing 107·5 mm; flattened wing 111·4 mm; tail 58 mm; exposed culmen 27 mm; gape 35 mm; tarsus 54 mm; weight 116 g.

The new pitta is named for my close friend Miss Deborah Bodner.

Habitat

The locality is in tropical evergreen forest of the Lower Montane Rain Forest type (Whitmore & Burnham 1969). All three calling pittas were on very steep slopes, where the canopy was 10–20 m high and ground cover moderate to dense.

Nest and Eggs

The nest site was about 3 metres up in the base of a leaf axil of a large palm. The tree was about 40 cm in diameter at nest level and was not identified. The nest was globular, slightly flattened from top to bottom, about 220 mm across by 180 mm high. It was constructed mostly of layers of dead leaves and leaf-skeletons of various broad-leafed trees, plus some palm leaflets, dead fern stems, a few woody rootlets and in the base some sticks up to 5 mm thick. A moderate lining in the lower half of the nest chamber consisted entirely of black plant fibre, possibly from palms, and some fungal hyphae. The nest chamber measured 130 mm front to back and the entrance, which tilted up 20° from the horizontal, 85 mm across by 55 mm from top to bottom.

There were 2 eggs, measuring 29·3 × 25·0 mm and 30·5 × 25·3 mm., the former containing an advanced embryo, the latter addled. They were slightly glossed white with masked purple-brown speckles over the broad end and irregularly shaped chestnut-red speckles fairly dense on the broad end, rather sparse elsewhere. These data compare with 2 possible pitta eggs collected by Allen (1953) from a dead-leaf nest which had collapsed on the ground near the site of the present nest. Those eggs were white, the large end fairly heavily spotted with dark brown and purple; 32 × 24·5 mm and 31 × 25·4 mm.

Habits, field marks and voice

The pittas were extremely shy, never allowing more than a glimpse of a shadow on the ground. The only good views I got in the field were of the

head of one bird while it was incubating eggs, and several good but brief looks as it flew from its nest. They responded readily to playback of their call and moved closer to the call, but remained well hidden while doing so. The netted bird actually responded to taped calls while incubating.

In flight, the blue rump and upper tail coverts are quite conspicuous, contrasting sharply with the green mantle. Once, in a poor glimpse, the only colour I saw was this blue (which may account for reports of blue-backed pittas in this area). In the hand, there is a little white at the base of the underside of the outer primaries, but this was not noticed in the field.

The call-note is a loud melodious *teew-what'* or *chew-whaa'*, the first note inflected downward, the second note higher and more emphatic. The alarm-note heard when I was in the vicinity of the nest was a loud, emphatic, woodpecker-like, metallic *check* or *weck*, sometimes run into a rattle when highly agitated, e.g. just after being flushed from its nest. It also uttered a soft, burry, but somewhat musical churr, *chur-r-r-r-rt*, *tur-r-r-r-rt*, or *wer-r-r-r-rt* when I was near the nest and it was nearby on the ground. All the above calls, except the rattle, were taped and are on deposit at the Laboratory of Ornithology at Cornell University.

Acknowledgements: Dr. David Wells of the University of Malaya, Kuala Lumpur, was very helpful in the drafting of the manuscript and kindly prepared the specimen. Bernard Bond and Julian Perry helped collect the pitta. Ken Scriven provided the tape-recording of the pitta's voice that I used to locate the bird, and was helpful in other ways. Dennis Yong was my gracious host in Kuala Lumpur. Dr. Ernst Mayr kindly sent me a copy of his draft manuscript of *Pitta oatesi* for a forthcoming volume of Peters' 'Check-list of Birds of the World'. Dr. Dean Amadon, Dr. Eugene Eisenmann, John Farrand, Dr. Kenneth C. Parkes, Dr. Lester L. Short and Dr. Francois Vuilleumier made helpful suggestions on the manuscript. I wish to thank the staffs of the American Museum of Natural History in New York and the United States National Museum for use of their specimens of *Pitta oatesi*.

Postscript. A statement by W. R. Davison (*Stray Feathers* (1878) 6: 238) casts doubt on the circumstantial attribution of a 'melodious *bong-bong*' call to *Pitta o. oatesi* by Deignan (*Bull. U.S. Natn. Mus.* (1945) 186: 264) in northern Thailand. The same race occurs in Burma where Davison, who collected many specimens of both *P. oatesi* and *P. cyanea*, found its call indistinguishable from that of the latter. King *et al.* (*A Field Guide to the Birds of Southeast Asia* (1975): 242) give the call of *P. cyanea* as '*a choooo-wit*', the second note drawn out, at first descending and then rising in pitch; the last note sharp'. Apart from the initial syllable this reasonably resembles the advertising call of the newly described *Pitta oatesi deborah*—here independently verbalised as *tyaw-whek*, the second note briefer, higher-pitched and emphatic. By inference the calls of *P. o. deborah* and *P. o. oatesi* should be at least as similar.

20 February

D. R. Wells, Zoology Dept. University of Malaya,
Kuala Lumpur 22–11, Malaysia.

I believe Dr. Wells is correct. In February 1978, I taped *Pitta nipalensis* in Asssam. Its call is quite like *Pitta oatesi deborah*. Baker ('Fauna of British India', Vol. 3: 447) states of *Pitta oatesi* 'It has the same beautiful loud double whistle' as *Pitta nipalensis*. Thus I believe Deignan either described the call (melodious *bong-bong*) poorly or attributed it to the wrong species. The *bong-bong* could well be *Otus spilocephalus* or an *Arborophila* partridge.

B. K.

References:

Allen, F. G. H. 1953. Further notes on birds nesting at Fraser's Hill. *Malay. Natur. J.* 8: 16–22.

— 1959. Notes on two rare birds. *Malay. Natur. J.* 14: 37.

Bromley, E. H. 1952. A note on birds seen at Maxwell's Hill, Perak, April 1950 and February 1951. *Bull. Raffles Mus.* 24: 199–218.

Deignan, H. G. 1945. *The Birds of Northern Thailand*. Smithsonian Inst: Washington.

Delacour, J. 1932. Etude systématique de quelques oiseaux noveaux ou intéressants obtenus par la VI^e Expedition en Indochine. *L'Oiseaux* 2 (3): 419–438.

Delacour, J. & Jabouille, P. 1930. Description de trente Oiseaux de l'Indochine Française. *L'Oiseaux* II (7): 393–408.
— 1940. Liste des oiseaux de l'Indochine Française, complétée et mise a jour. *L'Oiseaux* 10 (1 & 2): 89–220.
Hume, A. O. 1873. *Hydrornis oatesi* sp. nov. *Stray Feathers* 1 (6): 477–478.
Hume, A. O. & Davison, W. 1878. A revised list of the birds of Tenasserim. *Stray Feathers* 6 (1–6): 237.
Mayr, E. (In manuscript). Family Pittidae. *In* J. L. Peters, *Check-list of Birds of the World.* Vol. 8.
Wells, D. R. & Lord Medway. 1976. *The Birds of the Malay Peninsula.* Vol. 5. H. F. & G. Witherby: London.
Whitmore, T. C. & Burnham, C. P. 1969. The altitudinal sequence of forests and soils on granite near Kuala Lumpur. *Malay Natur. J.* 22: 99–118.

Address: c/o Ornithology Dept. American Museum of Natural History, 79th St. at Central Park West, New York, N.Y. 10024, U.S.A.

IN BRIEF

First record of Black-headed Gull *Larus ridibundus* and third record of Herring Gull *Larus argentatus* for South America

On 3 October 1976 I identified an adult Black-headed Gull *Larus ridibundus* amongst a flock of Laughing Gulls *Larus atricilla* on the foreshore at Pointe-a-Pierre on the west coast of Trinidad, and another adult *L. ridibundus* flew in soon afterwards to join the flock. The birds were also seen by R. P. ffrench, D. C. Gilbert and R. A. Harding. These are the first records of *L. ridibundus* for South America (Meyer de Schauensee 1970 and pers. comm.). The species has been recorded in the Caribbean, particularly on Barbados, several times however, so it may occur more regularly in South America and has probably been overlooked.

In the same gull flock on the same day there was also a first-year Herring Gull *Larus argentatus* which was only the second record for Trinidad (see ffrench 1973). The only other certain record of the species off South America is one on the Isla de Aves (15° 42′ N, 83° 40′ W) (Meyer de Schauensee pers. comm.).

Attention should clearly be paid to gull flocks wherever they occur throughout the world, since unexpected species alien to each area may frequently be missed. Wandering of birds in this family must surely be of widespread occurrence.

21 January 1978 David J. Fisher

References:

ffrench, R. P. 1973. *A Guide to the Birds of Trinidad and Tobago.* Wynnewood: Livingston Publishing Company.
Meyer de Schauensee, R. 1970. *A Guide to the Birds of South America.* Wynnewood: Livingston Publishing Company.

Address: c/o R.S.P.B., The Lodge, Sandy, Bedfordshire, SG19 2DL, England.

A hybrid *Hirundo rustica* x *Delichon urbica* in Zambia

On 17 December 1974 I caught a hybrid swallow while ringing hirundines at a roost near Choma in southern Zambia. It shows characters of both the European Swallow *Hirundo rustica* and House Martin *Delichon urbica*, and resembles closely one reported from southern England by Charlwood

(*Brit. Birds* (1973) 66: 398–400, Plate 60a). The specimen is in the Livingstone Museum.

Some 16 putative hybrids between these 2 species have now been reported, from western Europe to Japan, but this appears to be the first recognised in Africa.

During November and December 1974 I caught 10,250 European Swallows at the Choma roost, but only a single House Martin, which species was very scarce in the area. Clearly, this hybrid was travelling with European Swallows. The breeding areas of European Swallows ringed at Choma are western Russia (11 recoveries), Poland (6) and elsewhere in western Europe (6). Most birds in the roost are on passage to wintering grounds further south, and 2 have been recovered in South Africa.

26 January 1978. R. J. Dowsett.

Address: Livingstone Museum, P.O. Box 498, Livingstone, Zambia.

Occurrence of Javan Little Tern *Sterna albifrons sinensis* in West Africa

While gathering data for a check list of the birds of Ghana, I had my attention drawn by C. M. N. White to a statement in Serventy, Serventy & Warham (1971, *The Handbook of Australian Sea Birds*) of a Little Tern *Sterna albifrons* ringed as a fledgling in Java on 3.iii.1949 and recovered on 4.xii.1952 at Denu in Ghana. Because of the interest of the record it seems worthwhile making it more accessible for others. No documentation of the record was given by Serventy *et al.* (*loc. cit.*) and no mention of it is made in Mackworth-Praed & Grant (1970, *Birds of West Central and Western Africa*, Vol. 1). Correspondence with R. Spencer (Tring) and B. J. Speek (Arnhem) confirms the accuracy of the record and the latter is "absolutely sure that the recovery is correct" and that there is no possibility of it being a duplicate ring or one being used out of sequence. The ring (Leiden No. D57500) was returned to Leiden in a letter dated 4.x.1954 and sent by the Ministry of Agriculture, Accra. The details appear in *The Ring* (7: 144) and the only correction to the statement by Serventy *et al.* (*loc. cit.*) is that the date of ringing was 20 March, not 3 March.

1 April 1978. L. G. Grimes.

Address: Rossall School, Fleetwood, Lancs.

BOOKS RECEIVED

Wagstaffe, R. 1978. *Type Specimens of Birds in the Merseyside County Museums*. Pp. 33, Pl. 2. Merseyside County Museums, William Brown Street, Liverpool L3 8EN. £2.00+postage and packing.

The many type specimens in the Liverpool Collection are listed for the first time. Material from islands in the Pacific and Indian Oceans is specially well represented and includes such important specimens as the unique types of *Aegotheles savesi* and *Necropsar leguati*.

Hardy, Eric. 1978. *A Guide to the Birds of Scotland*. Pp. 1–132, many maps and photographs. Constable: London. £3.95.

A useful and knowledgeable visitors' 'guide to modern bird haunts' in thick pocket size, indicating accurately how to reach and obtain permission to visit almost anywhere in Scotland for interesting birds, surprisingly without providing too much overt help to marauders of rare species. The distracting parenthetic insertion of equivalent measures in metric or otherwise must have added some 10 unnecessary pages to the text. Well produced at the price.

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An author wishing to introduce a new name or describe a new form should append *nom.*, *gen.*, *sp.* or *subsp. nov.*, as appropriate, and set out the supporting evidence under the headings "Description", "Distribution", "Type", "Measurements of Type" and "Material examined", plus any others needed.

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British Ornithologists' Club

Edited by

Dr. J. F. MONK

Volume 98 No. 4 December 1978

FORTHCOMING MEETINGS

Tuesday 9 January 1979 at 6.30 p.m. for 7 p.m. at the Senior Common Room, South Side, Imperial College (entrance on the south side of Prince's Gardens, S.W.7, off Exhibition Road), Mr. J. H. R. Boswall on *Mutual Mimics, men as birds and birds as men—an ornithological frolic*. Those wishing to attend should send a cheque for £3.80 a person together with their acceptance to Mrs. Diana Bradley, 53, Osterley Road, Isleworth, Middlesex, to arrive not later than first post on Thursday 4 January 1979. (A slip for this meeting was enclosed in the last number of the *Bulletin*.)

Tuesday 6 March 1979 at the Senior Common Room, South Side, Imperial College, Prince's Gardens, S.W.7, Mr. M. D. England, O.B.E., on *The birds of the Seychelles group of islands*, illustrated with his slides. Those wishing to attend should send a cheque for £3.80 a person together with their acceptance on the enclosed slip to Mrs. Diana Bradley, 53, Osterley Road, Isleworth, Middlesex, to arrive not later than first post on Thursday 1 March.

Tuesday 15 May 1979 at 6.30 p.m. for 7 p.m., Dr. B. Stonehouse on *Penguins and loss of flight in birds*.

No liability is accepted for any damage, injury or loss suffered by any person in connection with attendance at a Club meeting.

Bulletin of the
BRITISH ORNITHOLOGISTS' CLUB

Vol. 98 No. 4 Published: 20 December 1978

The seven hundred and fourteenth meeting of the Club was held in the Senior Common Room, South Side, Imperial College, London, S.W.7 on Tuesday 19 September 1978, at 7. p.m.

Chairman: Dr. J. F. Monk: present 19 members and 7 guests.

Sir Hugh Elliott, BT., O.B.E. spoke on some problems of the heron family and illustrated his address with slides, both of photographs of heron species and of recent paintings of herons.

He pointed out that in the case of a surprisingly large proportion of these species, 18 out of a total of 61, there was little known and that no nests had been found of three— Fasciated Tiger Heron *Tigrisoma fasciatum*, Zigzag Heron *Zebrilus undulatus* and White-eared Night Heron *Gorsachius magnificus*. He gave information about these 18 species and explained reasons for them being still so substantially unknown. Among other problems, he discussed the very slow attainment of full adult plumage in South American tiger herons and canopy forming by the Black Heron *Egretta ardesiaca* for feeding.

Notes on the Rufous-capped Thornbill *Chalcostigma ruficeps*, a new hummingbird species for Colombia

by Karl-L. Schuchmann

Received 1 July 1978

During a field study of hummingbirds of the Cauca Valley and the western Andes near Cali, Colombia, 2 specimens of the Rufous-capped Thornbill *Chalcostigma ruficeps* were observed during March 1977 in the Paramo zone at Pan Azucar (elevation 3800 m). According to de Schauensee (1970) the northern geographic limit of this species does not extend beyond the Andes of southeastern Ecuador and the species is unrecorded in Colombia. At present, little information is available on hummingbirds restricted to the upper temperate zone, so that it is impossible to judge whether *C. ruficeps* is a migrant or a resident species in Colombia.

Both individuals, one of which was trapped (skin deposited in the Senckenberg Museum), collected nectar from blossoms of *Fuchsia canescens* (Oenantheraceae). Hovering for food was rarely seen; clutching the infloresence was the most common feeding technique observed. Corolla slits pierced by Glossy Flower-piercers *Diglossa lafresnayii* were often used to reach nectar normally inaccessible in such types of flower.

With regard to the taxonomic status of *C. ruficeps* there is still much uncertainty. Peters (1945) included it in the genus *Metallura*, whereas Zimmer (1952) and de Schauensee (1970) placed it in the *Chalcostigma* group. According to my own rather fragmentary observations, the Rufous-capped Thornbill, with its butterfly-like flight and soft trilling song, is more like the Metaltails (*Metallura*) than the thornbills (*Chalcostigma*). Comparative observations were made in the field and laboratory on the Fire-throated

Metaltail *Metallura eupogon*, the Tyrian Metaltail *Metallura tyrianthina*, the Bronze-tailed Thornbill *Chalcostigma heteropogon* and the Rainbow-bearded Thornbill *Chalcostigma herrani* (Schuchmann pers. obs.).

References:
De Schauensee, R. M. 1970. *A Guide to the Birds of South America.* Livingston: Pennsylvania.
Peters, J. L. 1945. *Check-list of Birds of the World.* Vol. V. Harvard Univ. Press: Cambridge.
Zimmer, J. T. 1952. Studies of Peruvian birds: 62. *Amer. Mus. Novitates* 1595.

Address: K.-L. Schuchmann, Zoological Institute, University of Frankfurt, Siesmayerstr. 70, 6000 Frankfurt/M., West Germany.

Further notes on *Lophophorus sclateri*

by G. W. H. Davison

Received 9 June 1978

The eastern population of the pheasant *Lophophorus sclateri* has been described as a new subspecies (Davison 1974). Further examination of the small series of skins in the British Museum (Natural History) has shown more characters which appear to vary in an east–west fashion. The skins examined were from Pachakshiri, Lo La and Pome in southeast Tibet (5 males and 3 females) in the west of the species' range, from Yunnan and north Burma (5 males and 3 females) in the east, and 2 males from the intermediate locality of Mishmi Hills, Arunachal Pradesh.

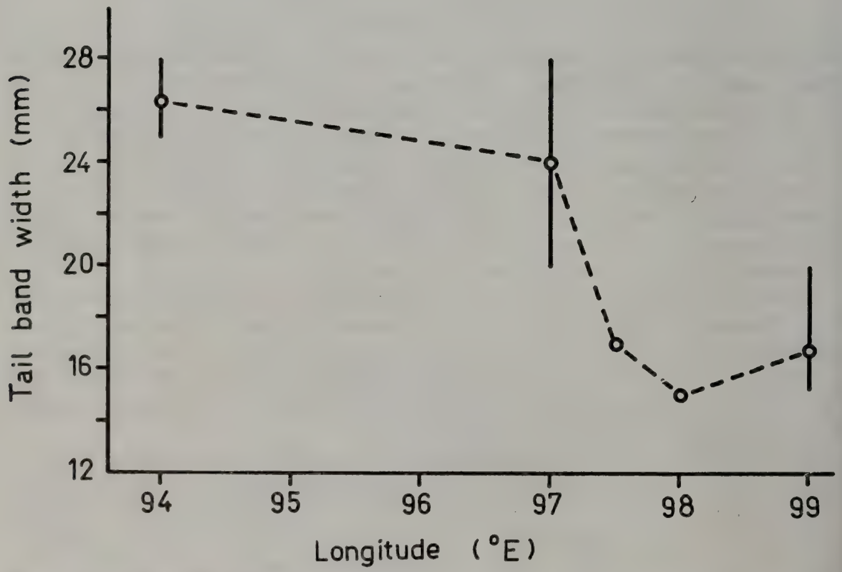

Fig. 1. Variation with longitude in the width of the terminal white tail band of male *Lophophorus sclateri*. The points show the mean tail band width, the vertical bars the range.

The description of *L. s. orientalis* emphasized the narrowness of the terminal white tail band in eastern males. Fig. 1 shows that the tail band width decreases sharply east of 97° E. It is not known whether this change corresponds with a change in habitat, but it does coincide with the eastern limit (Yin 1970) to the distribution of *L. impejanus*. Only western and Mishmi populations of *L. sclateri* overlap with this congener. In the region of overlap the 2 species are found in close proximity (Ludlow 1951). In all the members of this genus the tail pattern is conspicuous in display (see, for example, Schenkel 1956), and the greater width and conspicuousness of the white tail band in western *L. sclateri* may increase the distinctness of the 2 species' displays where the possibility of hybridization exists.

The iridescent green crown feathers of males are strongly recurved (Delacour 1951) and this gives the crown a woolly appearance. In 5 western males curvature of the crown feathers was very strong, from 100° to 180° or a full semicircle. The crown feathers of 2 Mishmi Hills males were similar. In 3 eastern males the crown feathers had a curvature of only up to 30°, in a fourth up to 40°, and in a fifth up to 60°. This variation was not seasonal, nor was it due to abrasion of the feathers which were of similar length in all males.

Four western males had the chin and throat entirely black, while the fifth, completing the moult from subadult to adult plumage, had a tiny centrally placed white bar on one or two feathers behind and below the gape on each side. Two Mishmi Hills males had the chin and throat entirely black. Of the 5 eastern males only one had the chin and throat entirely black, and 4 had at least a few white marks at the centre or sides of the chin. Four western males had entirely black thighs while the fifth had some pale buff vermiculations: 4 eastern males had entirely black thighs and the fifth some dark brown vermiculations. Both Mishmi Hills males had entirely black thighs.

Four fully adult western males had fulvous feather tips and some wholly fulvous feathers in the centre of the belly. The fifth, completing the moult into fully adult plumage, had the belly entirely black, as did the 2 Mishmi Hills males and all 5 eastern males. The black ventral surface in male *Lophophorus* is of significance in territorial displays between males (Harrison 1971): as with the white tail band, fulvous feathers in western *L. sclateri* may increase the distinctness of its displays from those of *L. impejanus* in the region of overlap.

Three western females had a slight fulvous tinge to the centre of the belly which was absent from the eastern females. Western females were all very similar, with dark underparts narrowly vermiculated and with dark rufous wing coverts. Eastern females were more variable, with generally paler plumage, and broader vermiculations on the underparts, rump and upper tail-coverts, and less richly coloured wing coverts.

Though both male and female *L. sclateri* vary in an east–west direction, the causative factors may not be the same for the 2 sexes. Western birds (in southeast Tibet) live in an area with much higher rainfall than do eastern ones (Vaurie 1972). This climatic difference may have influenced the plumage colour of the females.

Acknowledgements: I am indebted to the authorities of the British Museum (Natural History) for permission to examine the skins.

References:
Davison, G. W. H. 1974. Geographical variation in *Lophophorus sclateri. Bull. Br. Orn. Cl.* 94: 163–164.
Delacour, J. 1951. *Pheasants of the World.* Country Life, London.
Harrison, C. J. O. 1971. Frontal pattern and wing whirring in some pheasant species. *Pheasant Trust Ann. Rep.* 1970: 15–16.
Ludlow, F. 1951. The birds of Kongbo and Pome, southeast Tibet. *Ibis* 93: 547–578.
Schenkel, R. 1956. Zur Deutung der Balzleistungen einiger Phasianiden und Tetraoniden. *Orn. Beobachter* 53: 182–201.
Vaurie, C. 1972. *Tibet and its Birds.* Witherby, London.
Yin, U Tun. 1970. Record of the Himalayan Monal *Lophophorus impejanus* (Latham) in Burma. *J. Bombay Nat. Hist. Soc.* 67: 328–330.

Address: G. W. H. Davison, Dept. of Wildlife and National Parks, Block K20, Jalan Duta, Kuala Lumpur, Malaysia.

The onset of prebasic body moult during the breeding season in some high-Arctic waders

by P. N. Ferns

Received 21 April 1978

Wading birds nesting in the Arctic have 4 alternative schedules of prebasic (postnuptial) moult. Some species undergo a relatively rapid moult at, or hear, the breeding grounds (Holmes 1966, Bengston 1975), while others embark on a more leisurely moult after migrating south (Soikkeli 1967, Holmes 1971, Nieboer 1972). Intermediate schedules also occur, in which prebasic moult is started near the breeding grounds, and is then either suspended or continued during the southerly migration (Holmes 1972, Pienkowski *et al.* 1976). During the 1974 Joint Biological Expedition to N.E. Greenland (25 June–31 August), 4 species of adult wading birds were captured during the late stages of incubation or after the hatching of their young. These birds were examined thoroughly for any traces of moult and information was also recorded on the refeathering of the incubation patches. In the absence of museum specimens showing moult of the remiges or retrices it had previously been assumed that all these species underwent the whole of the prebasic moult at, or en route to, the wintering quarters.

The species examined were *Charadrius h. hiaticula*, *Arenaria i. interpres*, *Calidris alba* and *Calidris alpina arctica*. They were captured between 25 June and 10 August in wire traps or small clap-nets, set over nests or young pulli, at 3 sites along the southwestern shores of Kong Oscars Fjord in N.E. Greenland (c 72°N). Most birds examined in detail were from Orsted Dal, the remainder coming from Mestersvig and Antarctics Havn. The extent of the moult in 4 regions of the body (coronal region of the capital tract, interscapular region of the dorsal tract, cervical and sternal regions of the ventral tract) was roughly quantified using a 5 point scale (all old=0, beginning of moult=10, middle of moult=20, end of moult=30, all new=40). This differs from the more complex scoring system used by Holmes (1966), but involves the same 4 regions of the body, and gives broadly comparable results. In most cases the date of hatching of the eggs of each adult was known, but otherwise an estimate was made using the methods described by Green *et al.* (1977).

Results

At Orsted Dal 4 out of 5 *Ch. hiaticula* and 6 out of 9 at Mestersvig showed some prebasic body moult (Fig. 1). The areas of the body involved were the throat, chest, breast, belly, flanks, crown, nape, mantle, back, rump, median and lesser upper wing-coverts, under tail-coverts and the innermost greater upper wing-covert, though not all in the same individual. The amount of body moult, when present, varied from a small amount on the crown, to the whole of the body plumage plus some wing-coverts. The overall average body moult score was 28, out of a possible maximum of 160. There was no significant difference between the moult scores of the sexes at either site, though in both cases the females had the higher scores. Overall, there was no significant correlation between moult score and date ($r=0{\cdot}23$, $p>0{\cdot}10$), or between moult score and the stage of the nesting cycle measured as days since hatching), although the latter approached significance ($r=0{\cdot}45$, $p=0{\cdot}05$–$0{\cdot}10$). There was a large difference between the average scores at Orsted Dal (48) and Mestersvig (17) and this was significant (Mann-Whitney

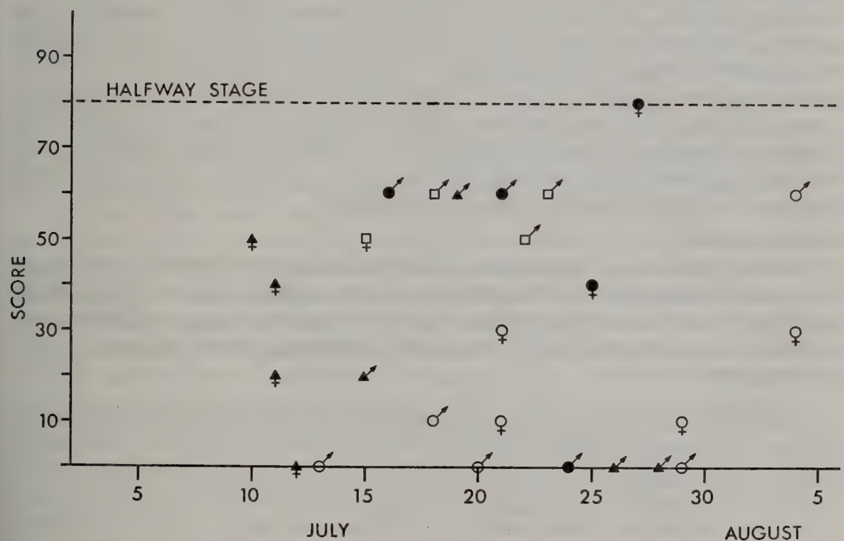

Fig. 1. Prebasic body moult scores of northeast Greenland waders in 1974. Open circles=*Charadrius hiaticula* at Mestersvig; closed circles=*Ch. hiaticula* at Orsted Dal; closed triangles=*Calidris alba* at all sites; open squares=*Arenaria interpres* at Orsted Dal. The sex of each bird is also indicated. For method of scoring see text.

U-test, $p=0{\cdot}01$ to $0{\cdot}05$). Most of this difference was no doubt due to the large disparity in the timing of breeding between the 2 sites—*Ch. hiaticula* at Mestersvig nesting on average 10 days later than at Orsted Dal (Green *et al.* 1977). The individual with the highest body moult score was a female at Orsted Dal accompanying a half grown chick on 27 July. The earliest date on which prebasic moult was recorded was 16 July and the earliest time in relation to the breeding cycle was 7 days before hatching. Two individuals,

neither of them undergoing body moult, were replacing respectively one and 3 tail feathers asymmetrically, presumably as a result of traumatic losses.

Arenaria interpres.

Of 8 *A. interpres* all of which were captured at Orsted Dal, 5 showed some prebasic body moult, ranging from a small amount on the undersides to an extensive moult of the spinal and ventral tracts. No moult was recorded on the head. The average moult score in these 8 birds was 24. This sample is too small for statistical analysis, but moult was more advanced in females (mean score 28) than in males (mean score 20), even though the latter were caught on average 11 days later in the nesting cycle. Moult scores of 40 and 50 were observed as early as 7 and 10 days before hatching, and the earliest date on which a moulting bird was caught was 10 July. There was a strong positive correlation between weight and moult score in this species ($r=0 \cdot 84$, $p=0 \cdot 001$ to $0 \cdot 010$), perhaps because heavier birds were in better condition and were therefore able to undertake a more extensive moult.

Calidris alba.

All 4 of the *C. alba* examined in detail showed extensive prebasic body moult. The average score was 55 and the earliest date on which moulting was observed was 15 July (about 5 days before hatching). In 2 of the 3 males examined, the rich brown feathers of the chest, which extend further ventrally than in females, had been almost completely replaced by the whitish feathers of the basic (winter) plumage. This probably explains why it became increasingly difficult to recognise males amongst the many adult birds observed in the field as the season progressed.

Calidris alpina.

None of the 11 *C. alpina* captured showed any trace of prebasic moult, but they were all captured close to the date when their eggs hatched. This species undergoes the whole of the prebasic moult on the breeding grounds in some regions (Holmes 1971), so it is particularly surprising that none was recorded in Greenland.

In all adults captured whilst attending pulli, refeathering of their incubation patches had begun around the edges, and it had also started in some birds which were still incubating. The earliest example of refeathering was a female *C. alba* captured on eggs on 12 July, 5 days before hatching. A male *C. alpina* caught in a mist net on 10 August amongst a flock consisting predominantly of juveniles, had pin feathers covering the entire area of the incubation patches. Despite the early onset of brood patch refeathering, these waders continued to brood their young from time to time, especially during inclement weather, for 2 weeks or so after hatching. Refeathering of the incubation patches before hatching has also been reported in *Anous minimus* (Jones 1971) and *Diomedea immutabilis* (Fisher 1971).

Discussion

Over 70% of individuals other than *C. alpina* had started prebasic body moult. Furthermore, this moult was quantitatively significant in view of the fact that the body feathers constitute about 80% of the total feather mass in waders (Holmes 1966). In *A. interpres*, the average moult score (including those individuals not in moult) indicates that at least 12% of the total feather

mass was being replaced on the breeding grounds. The equivalent figures were 14% for *Ch. hiaticula* and 28% for *C. alba*. Since *C. alba* nests earliest in this region, followed by *A. interpres*, *Ch. hiaticula* and *C. alpina* (Green *et al.* 1977) the extent of the prebasic moult appears to be related to the average timing of the breeding season in these species. The difference in moult between *Ch. hiaticula* at Orsted Dal and Mestersvig tends to confirm this.

The early onset of prebasic body moult amongst species which undergo the major part of their moult elsewhere has been recorded at several other sites in the Arctic, though it has seldom been quantified. Parmelee & MacDonald (1960) found traces of moult in small numbers of *A. interpres*, *C. canutus* and *C. alba* on Ellesmere Island (c 80° N). Parmelee *et al.* (1967) found traces of moult in *Ch. semipalmatus*, *A. interpres*, *C. melanotus* and *Phalaropus fulicarius*, together with extensive body moult in *Tryngites subruficollis*, on Victoria Island (c 69° N). *C. bairdii* had also started prebasic body moult at both of the above locations and on Baffin Island (c 69° N) (Wynne-Edwards 1952). Kistchinski (1975) recorded both prealternate (nuptial) and prebasic body moult in *P. fulicarius* on the breeding grounds in Siberia (c 70° N). *C. ruficollis* and *C. ferruginea* arrive at wintering quarters in Tasmania with arrested prebasic body moult showing that at least part of the moult occurs elsewhere, perhaps on the breeding grounds (Thomas & Dartnall 1971a, b). 47% of individuals of *C. mauri* in subarctic Alaska began prebasic body moult on the breeding grounds in June and reached an average score of 6 (maximum 40) before suspending for the southward migration, though adults associated with nests or young did not moult (Holmes 1972).

In view of the wide range of species and geographical areas from which this type of moult has been reported, it may be of greater importance than previously suspected. It presumably allows birds to take advantage of favourable feeding conditions towards the end of the breeding season and thereby reduces the amount of time spent at moulting areas further south. One curious feature of the prebasic body moult is that it starts in different parts of the body in different species. For example, in *C. mauri* the head is one of the first areas to start (Holmes 1972), whereas in *C. maritima* it is one of the last (Morrison 1976). In Greenland, the moult of the neck was particularly heavy in the early stages in both *Ch. hiaticula* and *A. interpres*, whilst the moult of the breast started early in *C. alba*. It may be significant that moult in these particular areas of the body tends to reduce the conspicuousness of the nuptial plumage.

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References:

Bengston, S.-A. 1975. Timing of the moult of the Purple Sandpiper *Calidris maritima* in Spitzbergen. *Ibis* 117: 100–102.

Fisher, H. I. 1971. The Laysan Albatross: its incubation, hatching, and associated behaviors. *Living Bird* 10: 19–78.

Green, G. H. & Greenwood, J. J. D. (Eds.). 1978. *Report of the Joint Biological Expedition to N.E. Greenland 1974*. Dundee: Dundee University N.E. Greenland Expedition.

Green, G. H., Greenwood, J. J. D. & Lloyd, C. S. 1977. The influence of snow conditions on the date of breeding of wading birds in north-east Greenland. *J. Zool. Lond.* 183: 311–328.

Holmes, R. T. 1966. Molt cycle of the Red-backed Sandpiper (*Calidris alpina*) in Western North America. *Auk* 83: 517–533.
— 1971. Latitudinal differences in the breeding and molt schedules of Alaskan Red-backed Sandpipers. *Condor* 73: 93–99.
— 1972. Ecological factors influencing the breeding season schedule of Western Sandpipers (*Calidris mauri*) in subarctic Alaska. *Amer. Midl. Nat.* 87: 472–491.
Jones, R. E. 1971. The incubation patch of birds. *Biol. Rev.* 46: 315–339.
Kistchinski, A. A. 1975. Breeding biology and behaviour of the Grey Phalarope *Phalaropus fulicarius* in east Siberia. *Ibis* 117: 285–301.
Morrison, R. I. G. 1976. Moult of the Purple Sandpiper in Iceland. *Ibis* 118: 237–246.
Nieboer, E. 1972. Preliminary notes on the primary moult in Dunlins *Calidris alpina*. *Ardea* 60: 112–119.
Parmelee, D. F. & MacDonald, S. D. 1960. The birds of west-central Ellesmere Island and adjacent areas. *Bull. Natn. Mus. Can.* 169: 1–103.
Parmelee, D. F., Stephens, H. A. & Schmidt, R. H. 1967. The birds of south-eastern Victoria Island and adjacent small islands. *Bull. Natn. Mus. Can.* 222: 1–229.
Pienkowski, M. W., Knight, P. J., Stanyard, D. J. & Argyle, F. B. 1976. The primary moult of waders on the Atlantic coast of Morocco. *Ibis* 118: 347–365.
Soikkeli, M. 1967. Breeding cycle and population dynamics in the Dunlin (*Calidris alpina*). *Ann. Zool. Fenn.* 4: 158–198.
Thomas, D. G. & Dartnall, A. J. 1971a. Moult of the Red-necked Stint. *Emu* 71: 49–53.
— 1971b. Moult of the Curlew Sandpiper in relation to its annual cycle. *Emu* 71: 153–158.
Wynne-Edwards, V. C. 1952. Zoology of the Baird Expedition (1950). I. The birds observed in central and south-east Baffin Island. *Auk* 69: 353–391.

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Undescribed *Acrocephalus* Warblers from Pacific Ocean Islands

by D. T. Holyoak & J.-C. Thibault

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During studies of Polynesian birds we have located old museum specimens of *Acrocephalus* spp. from Pacific Ocean islands that apparently represent 2 undescribed forms. Another form, known only from old descriptions, has been widely overlooked. All 3 populations are now almost certainly extinct, so it seems worthwhile to draw attention to them and give names to the undescribed forms since additional information is unlikely to become available.

Acrocephalus caffer garretti subsp. nov.

Description. Two apparently adult specimens are closely similar in coloration to *Acrocephalus caffer caffer* (Sparrman) from Tahiti (described in detail by Murphy & Mathews 1928), although the pale cream fringes to the feathers of the upperparts of the body may be slightly broader, especially on the rump and uppertail-coverts. However, they are substantially larger than *A. c. caffer*, especially the wing- and tail-length (Table 1). They differ from the large *A. c. longirostris* (Gmelin) of Moorea (described by Murphy & Mathews 1928), which has all but the central pair of retrices mainly pale cream, in having all the rectrices blackish-brown with narrow pale cream tips that are somewhat broader on the outermost feathers. They differ from Marquesas Islands populations in having much paler yellow underparts and other

differences in coloration, measurements or both (cf. Murphy & Mathews 1928, Holyoak & Thibault in prep.).

Type. Unsexed and apparently adult specimen with 'Museum Godeffroy' label having data '7915 leg A. Garrett; Huahine, Tahiti' that is registered as number 98.9.1.2535. in the collection of the British Museum (Natural History).

Material examined. Besides the type, another unsexed and apparently adult specimen with identical labelling to that of the type: registered as number 594897 in the collection of the American Museum of Natural History (measurements in Table 1).

TABLE 1

Measurements (mm) of *Acrocephalus caffer* from the Society Islands.
s = one standard deviation.

Form and Range		*Wing*	*Tail*	*Exposed culmen*	*Tarsus*
A. c. garretti					
(Huahine)	Holotype BM (NH)	106	89	28	33·3
	Paratype AMNH	106	88	27	33
A. c. caffer					
(Tahiti)	28 ♂♂	97·6 (s 1·94)	80·0 (s 2·14)	25·8 (s 1·18)	31·9 (s 0·87)
	9 ♀♀	95·4 (s 1·74)	77·8 (s 2·21)	25·8 (s 0·66)	30·8 (s 1·06)
A. c. longirostris					
(Moorea)	2 ♂♂	103, 106	85, 90	29, 30	31, 32
	1 ♀	105	88-5	29·5	30

Etymology. The name honours Andrew Garrett who collected all known specimens of this warbler, and many other Polynesian birds.

Notes. In a paper that has often been overlooked, Gräffe (1873) mentioned a warbler specimen ('*Tatare longirostris* Gml. 1 Exemplar') in the Museum Godeffroy, Hamburg, that was collected on Huahine by Andrew Garrett. Gräffe states that he considers Garrett's locality labels to be reliable and we have come to the same conclusion after seeing many specimens collected by him.

Canon Tristram (1889), in the printed Catalogue to his Collection, listed '*Acrocephalus otatare* . . . (b) Huaheine, 1877.—Garrett'. Tristram obtained numerous specimens from the Museum Godeffroy. In an earlier discussion of warblers from the Society Islands (Tristram 1883: 42) he commented 'Latham's type in the Derby Museum, from Eimeo [=Moorea], and my own from Tahiti and Huaheina are absolutely identical.' In case it be thought that these remarks argue against the distinctness of the Huahine warbler it should be pointed out that Tristram failed also to notice the distinctness of the Moorea population (cf. Murphy & Mathews 1928). Indeed, Tristram himself commented (1883: 42–43) when naming *Acrocephalus mendanae* [a distinctive Marquesan warbler now known as *A. caffer mendanae*], 'The next species I formerly, through unpardonable carelessness, stated to be identical with the Tahiti bird. I can only plead in excuse that I worked by gaslight, and failed to notice the distinction in colouration'. Tristram's specimen from

Huahine was probably lost during bombing in the last war along with most of the other Sylviidae of the old Liverpool Collection.

Andrew Garrett spent many years in Polynesia and collected numerous birds and other natural history specimens. We have seen specimens of *Halcyon tuta tuta* and other birds collected on Huahine by him. It seems likely that either the AMNH or the BM(NH) warbler specimen is the one mentioned by Gräffe, while the other of these like the Liverpool specimen (labelled 1877) was presumably collected after Gräffe wrote in 1873.

In naming the Huahine warbler we recognise that there is a name available for a warbler which may formerly have inhabited the neighbouring island of Raiatea, although the specimen is apparently lost, as discussed in the next section. However, where the species occurs on volcanic islands that are not very close together, taxonomically different populations of *A. caffer* are found on each (Murphy & Mathews 1928, Murphy 1938, Holyoak & Thibault 1977) so there is every likelihood that the virtually unknown Raiatea warbler differed from the Huahine population.

Warblers were not found on Huahine by the Whitney South Sea Expedition in 1921 nor by recent visitors, so there can be little doubt that they are extinct on the island. The Moorea warbler is now extremely rare and the Tahiti population has decreased considerably since the last century (Holyoak 1974, Thibault 1974, Holyoak & Thibault in prep.).

Acrocephalus caffer musae (J. R. Forster)

Oriolus musæ J. R. Forster, 1844, Descr. Anim. ed. Licht., p. 163.

Captain Cook's second and third voyages visited Raiatea, Society Islands, which they knew as Ulietea. Sharpe (1883) identified the bird described by J. R. Forster as *Tatare longirostris* Gmelin [now known as *Acrocephalus caffer longirostris* (Gmelin)] and Stresemann (1950) and Lysaght (1959) have agreed that it is an *Acrocephalus* warbler. J. R. Forster's description was clearly meant to refer to a drawing (no. 55) made by his son Georg Forster on Cook's second expedition, although the description and the drawing differ somewhat (Lysaght 1959), and Georg Forster's bird has been said to have been obtained on Tahiti, not on Ulietea (the drawing is marked Otahaite in unknown handwriting), which J. R. Forster lists as the locality for *Oriolus musæ*.

Stresemann (1950) suggested that Sparrman's type of *A. c. caffer*, which is preserved in the Stockholm Museum was more probably shot at Raiatea than at Tahiti, but there is no direct evidence for this and the specimen agrees with Tahiti birds (Sundevall 1860, Gyldenstolpe 1926, M. D. Bruce pers. comm.). We have been unable to locate any specimens of warblers from Raiatea in museums in Sweden (M. D. Bruce, B.-O. Stolt, L. Wallin, pers. comm.) or elsewhere but there seems little doubt that an *Acrocephalus* warbler was present on this island in the late eighteenth century.

If Georg Forster's plate 55 accurately represents the Raiatea warbler, it was probably a very large form with a very long bill (exposed culmen 34 mm) (cf. Lysaght 1959: 286). Such features could explain the size of the Huahine warbler which seems anomalously large in terms of the patterns of variation in size of Polynesian *Acrocephalus* discussed by Holyoak & Thibault (1977). Gene-flow to Huahine from a larger population of larger warblers on Raiatea could explain the anomaly.

Acrocephalus luscinia astrolabii subsp. nov.

Description. Two apparently adult specimens are closely similar to *Acrocephalus luscinia luscinia* (Quoy & Gaimard) from Guam and Saipan in coloration, with nearly uniform upperparts lacking the pale feather fringes that are

TABLE 2

Measurements (mm) of *Acrocephalus luscinia*. s = one standard deviation; * indicates measurements made by the authors; superscript numbers refer to footnotes.

Form and Range			*Wing*	*Tail*	*Exposed culmen*	*Tarsus*
A. l. astrolabii subsp. nov.						
(range uncertain)	Holotype		100	83	29·5	33
	Paratype		99	86·5	c 29·5	31·5
				(worn)	(broken)	
A. l. luscinia (Quoy & Gaimard)						
(Marianas Is.: Guam, Saipan, Alamagan)	Saipan	*5 ♂♂	87·5	77·6	26·5	31·1
			(s 1·58)	(s 2·88)	(s 0·79)	(s 0·42)
	Guam	*3 ♂♂	87·7	74·8	29·3	29·0
			(s 0·76)	(s 2·93)	(s 1·61)	(s 0·50)
	[1]? locality	1 ♀♀	78	73	27	28·5
A. l. yamashinae (Takatsukasa)						
(Marianas Is.: Pagan)	Pagan	[2]13 ♂♂	75–80	65–70	20–22	
		[2]6 ♀♀	73–77	60–65	20–22	
		[3]5 ♂♂	76–79	66–69		
		[3]2 ♀♀	75, 77	66, 67		
A. l. nijoi (Yamashina)						
(Marianas Isl: Agiguan)	Agiguan	[4]5			[27–29]	
A. l. syrinx (Kittlitz)						
(Caroline Is.: Woleai, Lamotrek, Truk, Lukunor, Nukuoro, Ponape, Kusaie)	Truk	*19 ♂♂	78·3	70·7	19·0	27·3
			(s 1·47)	(s 1·97)	(s 0·66)	(s 0·93)
		*7 ♀♀	75·3	67·1	19·2	26·7
			(s 1·11)	(s 1·21)	(s 0·49)	(s 0·86)
	Ponape	*18 ♂♂	78·4	70·3	19·8	26·7
			(s 1·60)	(s 2·27)	(s 0·64)	(s 0·90)
		*13 ♀♀	76·0	67·4	19·7	25·7
			(s 1·90)	(s 1·62)	(s 0·89)	(s 1·00)
A. l. rehsei (Finsch)						
(Nawodo or Pleasant I.)	Nawodo	[5]2 ♂♂	70, 72	59·5, 63·5	[14, 15]	25·5, 25·5
		[5]5 ♀♀	67·5–70	57–59·5	[14]	25·5

Notes. [1]Measurements from Baker (1951). [2]Measurements from Takatsukasa & Yamashina (1931). [3]Measurements of birds in MNHN made by E. Mayr and cited by Baker (1951); [4]from Yamashina (1940) who comments that *nijoi* has a slightly smaller bill than specimens of the nominate form (he gives measurements of 30–34 mm for birds from Saipan, suggesting he may have measured bill length from the gape); it is clear from the description that *nijoi* is little if at all larger overall than the nominate form. [5]Measurements from Finsch (1873), his inches and lines having been converted to mm by us; the very short bill lengths suggest he was measuring the bill from the nares.

prominent in the larger Polynesian *Acrocephalus*. The specimens differ from *A. l. luscinia* in their large size and relatively short bill (Table 2) and their extraordinarily stout tarsi, feet and claws. They are much larger than any of the other warblers of Micronesia (Table 2) and the combination of the coloration, size and heavy feet is quite different from that of any Polynesian or continental warbler.

Type. Unsexed and apparently adult specimen in the Muséum National d'Histoire Naturelle labelled 'Mangareva, Astrolabe, Philedon chanteur', the locality Mangareva probably being an error (see below). The specimen is numbered 151 and it is registered as number E 8681.

Material examined. Besides the type, another unsexed and apparently adult specimen in the MNHN (no registration number) labelled 'Philedon (chanteur), Nouheva [or Nouhira] 266 Astrolabe' in similar handwriting to that on the label of the type The locality Nouheva [=Nuku Hiva, Marquesas Islands?] is almost certainly an error (see below). For measurements see Table 2.

Etymology. Genitive of mediaeval Latin *astrolabium*, astrolabe, in honour of l'*Astrolabe*, the flagship of Dumont D'Urville's Second Antarctic Expedition.

Notes. The type was registered in the MNHN catalogue as E 8681 following 'D 8681 *Acrocephalus* syrinx K et F. Carolines- Hombron et Jacquinot 1841–106'. E 8681 is marked as ' " " [=*Acrocephalus* syrinx] Mangareva H et J. 1841–112'. There is thus little doubt that E 8681 was obtained on the Antarctic Expedition under Captain J. Dumont D'Urville in the *Astrolabe* and *Zelee*, with Hombron and Jacquinot as naturalists. This expedition travelled widely in the tropical Pacific in 1838–1839 and visited numerous islands in Polynesia and Melanesia and a few in Micronesia.

The published accounts of the naturalists on the expedition give few clues as to the likely origins of these warbler specimens. The characters described above suggest affinity with Micronesian warblers, so it seems likely that the specimens were obtained in Micronesia rather than Melanesia or Polynesia. Lacan & Mougin (1974) suggested the specimens were from Mangareva in the Gambier Islands in accordance with the label on the specimen we have selected as the type, but the conflicting 'Nouheva' [or Nouhira] on the other specimen casts doubt on the reliability of the labelling. Moreover, the large size of these specimens argues against origin on Mangareva as it is not in accordance with the well marked patterns of variation in Polynesian warblers (Holyoak & Thibault 1977), and their resemblance to Micronesian warblers has already been stressed.

Dumont D'Urville (1841–1846) records that the expedition under his charge visited the islands of Losap, Truk, Guam, Yap and Peleliu in Micronesia. *Acrocephalus* of very different appearance are known from Guam and from Truk (Baker 1951; Table 2) and none of the Pacific Islands is known to have more than one type of warbler. It may be speculated that the high volcanic island of Yap, from which no warbler is known, could be the source of the *Astrolabe* specimens. The first real ornithological exploration of Yap took place many years later when Hartlaub & Finsch (1872) described some of the endemic land birds and a warbler could have become extinct before then. However, there is apparently no way in which the origin of this very distinctive warbler can be securely established.

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References:

Baker, R. H. 1951. The avifauna of Micronesia, its origin, evolution and distribution. *Univ. Kansas Mus. Nat. Hist. Publ.* 3.

Dumont D'Urville, J. S. C. 1841–1846. *Voyage au Pole Sud et dans l'Oceanie sur les corvettes l'*Astrolabe *et la* Zélée, *execute par ordre du roi pendant les annees 1837–1838–1839–1840, sous le commandement de M. J. Dumont D' Urville* . . . Paris. 10 vols.

Finsch, O. 1873. On a new Reed-Warbler from the island of Nawodo or Pleasant Island, in the Western Pacific. *Ibis* Series 5 (1): 142–144.
Gräffe, E. 1873. Vogelbälge aus Huahine. *J. Mus. Godeffroy, Hamburg* 1: 48–51.
Gyldenstolpe, N. 1926. Types of birds in the Royal Natural History Museum in Stockholm. *Arkiv. for Zoologi* 19: 1–116.
Hartlaub, G. & Finsch, O. 1872. On a fourth collection of birds from the Pelew and Mackenzie islands. *Proc. Zool. Soc. London* (1872): 87–114.
Holyoak, D. T. 1974. Les oiseaux des iles de la Société. *Oiseau, Revue fr. Orn.* 44: 1–27, 153–184.
Holyoak, D. T. & Thibault, J.-C. 1977. Habitats, morphologie et inter-actions écologiques des oiseaux insectivores de Polynésie orientale. *Oiseau, Revue fr. Orn.* 47: 115–147.
— in prep. L'Avifaune de Polynésie orientale.
Lacan, F. & Mougin, J.-L. 1974. Les oiseaux des Iles Gambier et de quelques atolls orientaux de l'archipel des Tuamotu (Océan Pacifique). *Oiseau, Revue fr. Orn.* 44: 193–280.
Lysaght, A. 1959. Some eighteenth century bird paintings in the library of Sir Joseph Banks (1743–1820). *Bull. Br. Mus. (Nat. Hist.), Hist.* 1: 251–371.
Murphy, R. C. 1938. The need of insular exploration as illustrated by birds. *Science, N.Y.* 88: 533–539.
Murphy, R. C. & Mathews, G. M. 1928. Birds collected during the Whitney South Sea Expedition. V. *Am. Mus. Novit.* 337.
Sharpe, R. B. 1883. Cichlomorphae: part 4. *Cat. Birds Brit. Mus.* 7.
Stresemann, E. 1950. Birds collected during Captain James Cook's last expedition (1776–80). *Auk* 67: 66–88.
Sundevall, C. J. 1860. Kritisk framställning af fogelarterna uti äldre ornithologiska arbeten. *K. Vet. Akad. Handl.* B2 (3): 4–5.
Takatsukasa, S. & Yamashina, Y. 1931. Some new birds from the Palao and Mariana Islands. *Dobutsu. Zasshi* 43: 484–487.
Thibault, J.-C. 1974. *Le peuplement avien des iles de la Societe (Polynesie).* Mus. Nat. Hist. Nat. & Hautes Etudes, Antenne de Tahiti.
Tristram, H. B. 1883. On the position of the Acrocephaline genus *Tatare*, with descriptions of two new species of the genus *Acrocephalus. Ibis* Series 5 (1): 38–46.
— 1889. *Catalogue of a Collection of Birds belonging to H. B. Tristram, D.D., LL.D., F.R.S.* Durham: printed at the *Advertiser* Office.
Yamashina, Marquis Y. 1940. Some additions to the 'List of the Birds of Micronesia'. *Tori* 10: 673–679.

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Records of birds from Timor: some additions and corrections

by Murray D. Bruce

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In a catalogue of the Timor specimens in the Museu Bocage, Lisbon, Bacelar (1958) listed seven species as either new to Timor or as range extensions for eastern (formerly Portuguese) Timor. I recently questioned the validity of two of these (Bruce 1975) as at the time I had been unable to obtain information on the specimens in question. This problem was rectified during a visit to the Museu Bocage on 28 November 1977, when I was able to examine all questionable specimens.

Falco s. subbuteo. The single mounted specimen (reg. no. 303G), collected

in January 1896 was photographed and comparison of the colour transparencies with material in the British Museum (Natural History) showed it to agree well in all plumage characters with specimens of *F. s. subbuteo* from central Asia; the thighs, lower belly and under-tail coverts are pale buff, indicating an immature bird. It is not the Australian *F. longipennis* as I suggested earlier (1975). The specimen thus represents the easternmost record of the species, which is only a rare vagrant to the Indonesian area.

Hemiprocne c. comata. The specimen proves to be *Collocalia esculenta*, a resident species of Timor. In my earlier note I had suggested mislabelling of this specimen, since *Hemiprocne comata* is unrecorded from Wallacea.

Of the other species listed by Bacelar as new for Portuguese Timor, two warrant a mention. *Halcyon s. sancta* is listed in the summary but not in the text. In the collection there are two mounted birds from the northern coast around Dili, where it was noted as common by their collector. The specimen identified as *Ficedula timorensis* proves to be *F. hyperythra*, a widespread resident species.

Mees (1976), in a note on overlooked Timor records of Salomon Müller, included comments on the lapwing *Rogibyx tricolor* (=*Vanellus cucullatus*) known by one mounted specimen from Timor. However, Forbes & Robinson (1899:64) listed two specimens from Timor in the Merseyside County Museums, Liverpool. I have examined these specimens, both collected early last century, almost certainly by Müller. One of these (reg. no. D.3008a) was obtained from Temminck by the dealer John Leadbeater and purchased by Lord Derby on 2 August 1840 (cf. Morgan 1975 for additional historical background of these collections). The second specimen (reg. no. D.3008) was obtained by Lord Derby from John Gould in November 1841 and most probably originated from Temminck, perhaps during a visit by Gould to Leiden (P. J. Morgan pers. comm.). Temminck was quite positive about the locality Timor, and additional evidence may be found amongst Müller's manuscript notes; but Mees (*in litt.*) doubts the provenance Timor of the Leiden specimen. As pointed out by Mees (1976), large numbers of birds were exchanged by Temminck and many of these specimens have since disappeared. This lapwing is now very rare and all recent records have been from Java (cf. Kooiman 1940).

Acknowledgements: For access to collections under their care I wish to thank Mr. I. C. J. Galbraith, British Museum (Natural History), Tring, Mr. P. J. Morgan, Merseyside County Museums, Liverpool, and Dr. A. A. Soares, Museu Bocage, Lisbon. Dr. G. F. Mees kindly assisted with enquiries on the Leiden collection.

References:

Bacelar, A. 1958. Aves de Timor no Museu Bocage. *Rev. Portug. Zool. e Biol. Ger.* 1:363–384.

Bruce, M. D. 1975. Some overlooked and doubtful records of birds from Timor. *Bull. Brit. Orn. Cl.* 95: 117–118.

Forbes, H. O. & Robinson, H. C. 1899. Catalogue . . . . of birds . . . . in the Derby Museum. *Bull. Liverpool Mus.* 2: 51–75, 117–150.

Kooiman, J. G. 1940. Mededeelingen over het voorkomen in Oost-Java van enkele voor dit gewest nog niet in de literatuur genoemde vogels. *Ardea* 29: 98–108.

Mees, G. F. 1976. Some birds recorded from Timor by Salomon Müller in 1828–29. *Emu* 76: 150–151.

Morgan, P. J. 1975. A catalogued specimen of *Coua delalandei* (Temminck) (Cuculidae) in Merseyside County Museums, Liverpool. *Bull. Brit. Orn. Cl.* 95: 62–64.

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Nuptial behaviour in the Genus *Coracina* (Campephagidae)

by S. Marchant

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Smythies (1964) stated that courtship display in some large cuckoo-shrikes (Campephagidae) consisted of the male lifting each wing alternately without opening the feathers, while calling vigorously, and Macdonald (1973) made a similar claim for the Black-faced Cuckoo-shrike *Coracina novaehollandiae*. Because shuffling of the wings in this fashion is performed by some species of *Coracina* at all times, even by solitary birds, there is doubt whether it is related to true courtship display. On the other hand, Rand & Gilliard (1967) stated that *Coracina papuensis* 'mated after a short period of mutual display, consisting of facing each other and fluttering their wings'. Skead (1966) and Marshall *et al.* (1968) described display by the Black Cuckoo-shrike *Campephaga phoenicia*, in which both birds hopped or fluttered about in trees with trilling calls, the male gaping at the female to expose the orange inside of his mouth. The duetting and displays by groups of birds, described by Diamond & Terborgh (1968), for *Campochaera sloetii*, *Coracina montana* and *C. schisticeps* were thought to be of a 'communal territorial nature'.

I can find no other references to displays and nuptial behaviour in campephagids, so that 2 performances by the Cicadabird *Coracina tenuirostris* and one by *C. novaehollandiae* that I witnessed near Moruya, New South Wales, in the breeding season of 1975–76 may be of interest.

Performances by *C. tenuirostris* occured at 18.00 on 28 November, 2 days before the pair started to build a nest, and at 09.30 on 4 December, 5 days before the egg was laid. (The species has never been known to lay more than one egg in a clutch.) I did not see which bird initiated the display because each time it had started before my attention was attracted. During display the female perched crosswise on a horizontal branch 5–10 m from the ground, crouching somewhat, with wings partly spread and quivered; otherwise she remained motionless. The male actively hopped round her and from side to side, mostly facing her, wings partly opened and tail spread, bowing towards her with neck extended, at the same time cocking his spread tail.

With each bow, as far as I could judge, he gave a loud arresting 'tick-oo' call with a peculiar and distinctive mechanical quality. On the first occasion, after less than a minute of this performance the male dived from the branch and flew away through the understorey with a protracted variation of its normal call, 'tchuit-t-t-t . . .'. I lost sight of the female. On the second occasion, after a minute or so of bowing and tickoo-ing the male faced the female, bowing more exaggerately than ever, as before with head extended, tail cocked and spread, tickoo-ing rapidly. He suddenly mounted the female, copulated for a few moments and dived away with the protracted 'tchuit-t-t-t . . .'. The female remained for a while, preened, then moved away. I heard the tick-oo call once later that season, two days before the egg was laid, and may have heard it in the distance once in the 1977–78 season. I have spent a long time each day in these birds' territories during their breeding seasons and have otherwise not heard the tick-oo call, which suggests that it is restricted to a brief period.

In contrast, *C. novaehollandiae* apparently mates with little ceremony (cf. *C. papuensis* above). At 08.30 on 15 November, a male (identified by subsequent behaviour) was perched on a small horizontal dead branch of a sapling gum tree, 5 m from the ground. The female flew and settled close by him and half-spread her wings. The male twisted towards her, peered at her rigidly, then mounted. Copulation took place quickly and the female immediately flew off and began to collect thin twigs for building.

Thus, the difference in nuptial behaviour within the genus *Coracina* seems considerable. The present *Coracina* genus was once split into 2 or 3. Peters (1960) put 41 species into *Coracina*, of which 4 from southeastern Asia have sometimes been separated under *Volvocivora*; I shall not refer to these again. Another 10 species, including *tenuirostris*, were once separated in the genus *Edolisoma*, which has now been included in *Coracina* because the morphological differences of size of bill and the sexual dimorphism, which generally distinguish these 2 sections, are linked by a series of intermediates in the region of New Guinea: *caeruleogrisea*, *lineata*, *boyeri*, *morio* and *schisticeps* The sexual dimorphism of *tenuirostris* and of species like it, e.g. *schisticeps*, is reminscent of the African genus *Campephaga*, and in my opinion the intermediate links between the essentially monomorphic section of the genus and the dimorphic one are too abrupt for sinking *Edolisoma*. In addition it is worth drawing attention to differences in voice, flight and nesting behaviour between *C. novaehollandiae* (sexually monomorphic) and *C. tenuirostris* (dimorphic), which may be taken as representatives of the two sections of the genus being discussed.

Voice. *C. novaehollandiae* has a variety of slurred liquid calls, giving an impression of leisureliness, even lethargy; *tenuirostris* gives a far-carrying energetic 'kree-kree-kree . . . .' song, a bit like that of some cicadas (hence its English name), and has various calls based on a sharp single note, 'tchuit'. *C. papuensis*, *pectoralis* and other species predominantly call like *novaehollandiae*, but *morio* (at least) calls like *tenuirostris*.

Flight. *C. novaehollandiae* flies in a leisurely dipping fashion with slow wing-beats and intervals of gliding; *tenuirostris* flies fast and direct with rapidly beating wings. On alighting, *novaehollandiae* most characteristically shuffles its wings, first one and then the other, without opening the feathers, whereas *tenuirostris* does not. Certainly several other species behave as *novaehollandiae*, but I can find no field descriptions of species that fly like *tenuirostris* and do not shufflle their wings.

Nesting. Though nests and eggs seem similar throughout the genus, both sexes of *novaehollandiae* build, incubate and tend the young; in *tenuirostris* probably the male alone builds, and certainly he does not incubate (pers. obs.), but both parents tend the young. The breeding behaviour of campephagids in general and of the genus *Coracina* in particular is so poorly recorded that comparison cannot go farther.

Much more needs to be known about the field characters of species of *Coracina* before the resurrection of the genus *Edolisoma* can be suggested, but on the face of it differences in nuptial behaviour, flight and voice between species such as *novaehollandiae* and *papuensis* on the one hand and *tenuirostris*, *schisticeps* and *montana* on the other seem to reinforce their differences in morphology and degree of sexual dimorphism.

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References:
Diamond, J. M. & Terborgh, J. W. 1968. Dual singing by New Guinea birds. *Auk* 85: 62–82.
Macdonald, J. D. 1973. *Birds of Australia.* Sydney: Reed.
Marshall, B. E., Cooper, J. & Groves, J. V. 1968. Courtship behaviour in the Black Cuckoo-shrike *Campephaga phoenicia. Ostrich* 39: 203.
Peters, J. L. 1960. *Checklist of Birds of the World,* IX. Cambridge, Mass.: Mus. Comp. Zool.
Rand, A. L. & Gilliard, E. T. 1967. *Handbook of New Guinea Birds.* London: Weidenfeld and Nicolson.
Skead, C. J. 1966. A study of the Black Cuckoo-shrike *Campephaga phoenicia* (Latham). *Ostrich* 37: 71–75.
Smythies, B. E. 1964. Article 'Cuckoo-shrike' *in* Thomson, A. L. (Ed.), *A New Dictionary of Birds.* London: Nelson.

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A re-appraisal of the systematic position of *Trichastoma poliothorax* (Timaliinae, Muscicapidae)

by C. F. Mann, P. J. K. Burton & I. Lennerstedt

Received 8 March 1978

Introduction

Aside from the Grey-chested Illadopsis *Trichastoma poliothorax*, whose systematic position is here in question, the genus *Trichastoma* contains 18 species (Deignan 1964). Of these, 11 are Asiatic, ranging from the Himalayas south and east through Burma and the Malay Peninsula to Indonesia and the Phillipines. The other 7 are African, ranging from W. Africa to Sudan, south to Malawi and Angola. All live close to the ground in dense undergrowth. They are smallish babblers, generally brown or rufescent above, and greyish, whitish, pale rufous or orange below, often with some scaling on head and underparts. In some the colour of the crown contrasts with the mantle. In all but *cinereiceps* the rictal bristles are very pronounced; and *cinereiceps* also differs from all the others in having a very short tail.

The systematic position of *poliothorax* has never been satisfactorily settled. The species was originally described as *Alethe poliothorax* (Reichenow 1900) and both Chapin (1953) and later Hall & Moreau (1970) suggested that it may be a turdine. Ripley (1952), in his treatment of the Turdinae, omitted it. Deignan (1964) gives no particular reason for its inclusion in the Timaliinae. Most recent authors agree, though expressing reservations, on placing it in the genus *Trichastoma* (or *Malacocinchla*, now merged with *Trichastoma*) in the subfamily Timaliinae (Chapin 1953, Hall & Moreau 1970, Mackworth-Praed & Grant 1960). C. F. M. has noticed a superficial resemblance of the bird in the hand to *Modulatrix stictigula.* (It should perhaps be mentioned that Benson & Irwin (1975) have removed *orostruthus* from *Phyllastrephus* and added it to *Modulatrix*, a previously monotypic genus.)

Our investigations have utilised skin specimens of all species of *Trichastoma*, and spirit specimens of the following: *T. tickelli, malaccense, rostratum, bicolor, albipectus, fulvescens, puveli* and *poliothorax.*

Distribution, Habitat and Habits

White (1962) gives the distribution of *T. poliothorax* as 'Fernando Po, southeast Nigeria at Obudu Plateau, Cameroon Mt., Kupe and Bamenda in Cameroons, northeast Congo from west of Lake Albert to Ruwenzori and Mt. Kabodo, west Kenya at Mt. Elgon and Lerundo in Kavirondo'. To this can be added the Impenetrable Forest, Uganda (Keith *et al.* 1969) and the South Nandi Forest, and adjacent parts of the Kakamega Forest (Ripley & Bond 1971). In netting operations in Kenya and Uganda over a period of 5 years, C. F. M. only found it in Kakamega and South Nandi Forests of western Kenya, at altitudes of 1560–1700 m: its distribution within the area was very patchy. Zimmerman (1972) spent a total of 9 months in the Kakamega Forest and never found it.

The species *poliothorax* is a scarce denizen of wet, montane forest, from 1500 m (900 m on Mt. Cameroon) to 2400 m, found on or near the ground. Like all in the genus, *Trichastoma* is a great skulker and is rarely observed except when flying across a path or captured in a mist net. Fortunately there was a small resident population in the main study area used by C. F. M., who thinks that it spends more time on the ground and less time higher in the undergrowth than most *Trichastoma*, but becuase of its fondness for deep cover observations on free living birds are few. Its presence is often revealed only by its distinctive call (see below).

Plumage

Whereas other members of *Trichastoma* have a rather coarse-feathered, somewhat untidy appearance, *poliothorax* is a finer, neater bird, with closer, denser feathering and much less obvious rictal bristles, and with a distinctive colour pattern, being mahogany-rufous above contrasting with dark grey underparts, which incline to white on the throat and centre of belly.

Of 4 immature birds, one from northeast of Lake Tanganyika (Chapin 1953), one from Dikume Balue, Cameroons (British Museum, examined by C. F. M.), and 2 captured by C. F. M. at Kakamega Forest, none had a typical spangled turdine immature plumage. The Cameroons specimen differs from the adult in having rufous-brown tips to the grey chest feathers, brown iris (red-brown in the adult), an orange-yellow gape and an unossified skull. The 2 Kakamega birds differed from adults in being less chestnut and more gingery on the sides of the face, rump and lower back, and showed a certain amount of olive on the grey chest. The irides were dirty-brown and the gape soft and yellow. In none of the 4 specimens is there any mottling above. Apparently no very young birds have ever been seen, and the nest and eggs are unknown. However, C. W. Benson suggests that a spangled plumage, if it exists, might be worn for a very short time and could easily escape notice. He quotes the example of *Pogonocichla stellata* in Malawi, for which he knows of only a single record of a spangled bird, whereas the olive immature dress is frequently seen.

Bill and Tongue

Bill form is extremely similar in all species of *Trichastoma*, including *poliothorax*. Rictal bristles are well developed in *Trichastoma*, less so in *cinereiceps* and even less well developed in *poliothorax*.

The tongue of *poliothorax* is distinctive. It narrows sharply from the base,

and the sides are strongly infolded, forming a 'U'-shaped cross-section. It is very narrow for most of its length, and has a frayed, brush-like tip. In the other species of *Trichastoma* examined the tongue is broad and flat, though also with a somewhat frayed tip.

Bill and tongue lengths are given in Table 1. The tongue is longest, relative to the bill, in *poliothorax*, only *malaccense* approaching it closely in this respect.

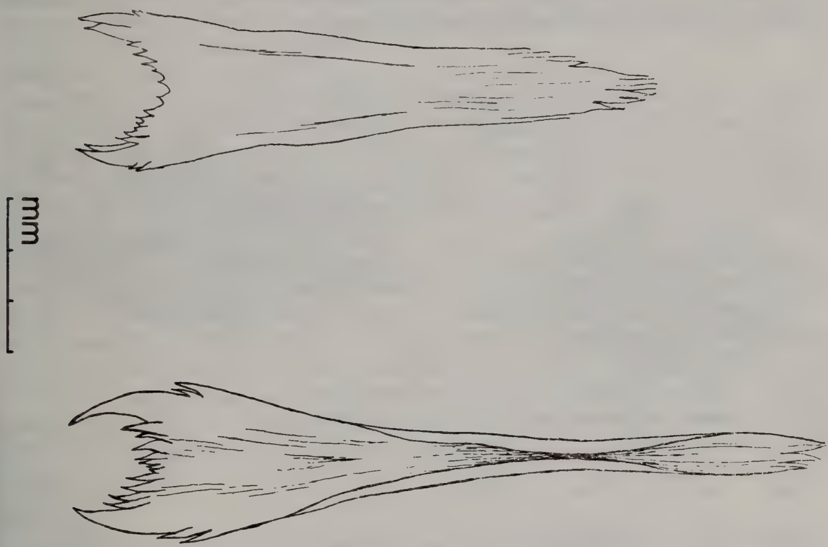

Fig. 1. Tongues of *Trichastoma albipectus*, above, and *T. poliothorax*, below.

Cranium

As the specimens available were spirit ones, a detailed osteological comparison was not undertaken. However, the skull of *poliothorax* differs noticeably from others of *Trichastoma* in its general shape (Table 1), being wider relative to its length than in other members of *Trichastoma*, and also more tapering, i.e. relatively narrower in front of the orbits than behind. An additional point of some interest is the angle made at the intersection of the

TABLE 1

Quantitative data on head morphology in the genus *Trichastoma*, including *poliothorax*.

	tickelli	*malaccense*	*rostratum*	*bicolor*	*pyrrhopterum*	*albipectus*	*poliothorax*
Cranium length from junction of nasal and jugal (A)	21·3	23·3	21·9	23·8	23·5	22·4	23·2
Greatest cranium width posterior to orbit (B)	16·0	16·2	15·9	18·0	17·6	16·9	16·0
Greatest cranium width anterior to orbit (C)	7·1	7·8	7·0	8·4	6·7	6·5	9·4
Anterior: Posterior width ratio C/B	0·44	0·48	0·44	0·47	0·38	0·38	0·59
Width: Length ratio C/A	0·33	0·33	0·32	0·35	0·28	0·29	0·41
Bill length, from junction of nasal and jugal (D)	15·7	16·1	17·1	19·2	14·0	14·7	17·0
Tongue length (E)	11·3	13·2	12·6	13·8	11·0	11·0	14·2
Tongue: Bill ratio E/D	0·72	0·82	0·74	0·72	0·79	0·75	0·84
Postorbital ligament/jugal angle	92°	92°	95°	90°	90°	87°	112°

post-orbital ligament and the jugal bar. The angle in the dorsal anterior quadrant of the intersection (Table 1) is considerably greater in *poliothorax* than in other members of *Trichastoma*.

JAW MUSCLES

Substantial differences between *poliothorax* and other *Trichastoma* species were noted in the structure of M. adductor mandibulae externus and M. pterygoideus. The terminology used here for subdivisions of these muscles is that employed by Richards & Bock (1973).

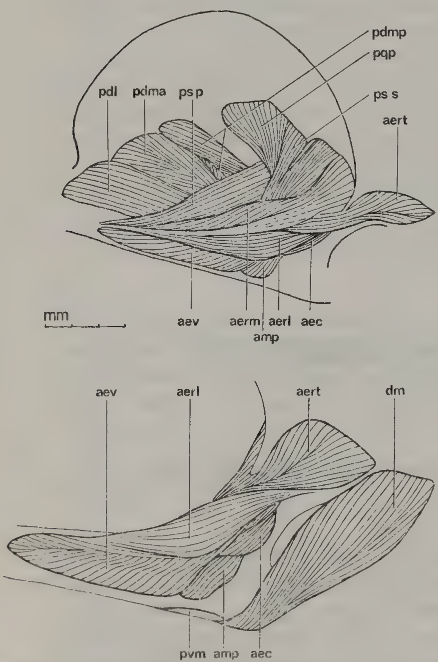

Fig. 2. Jaw musculature of *Trichastoma albipectus*. Dorsal view, upper; lateral view, lower.

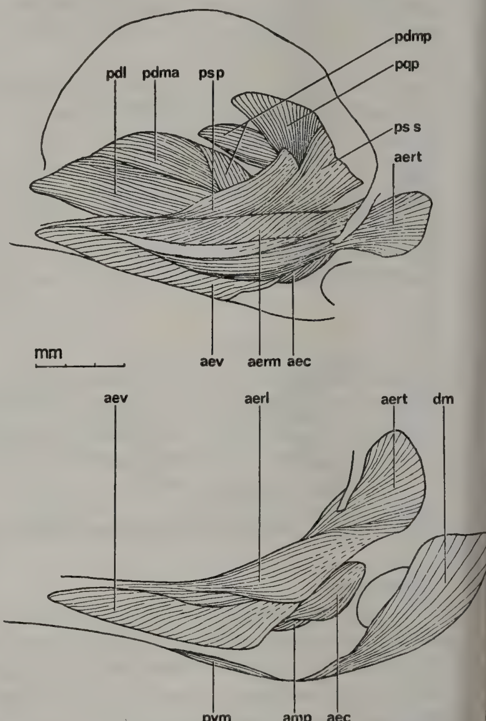

Fig. 3. Jaw musculature of *Trichastoma poliothorax*. Dorsal view, upper; lateral view, lower.

Key:—

aec — M. adductor mandibulae externus caudalis.
aerl — M. adductor mandibulae externus rostralis lateralis.
aerm — M. adductor mandibulae externus rostralis medialis.
aert — M. adductor mandibulae externus rostralis temporalis.
aev — M. adductor mandibulae externus ventralis.
amp — M. adductor mandibulae posterior.
dm — M. depressor mandibulae.
pdl — M. pterygoideus dorsalis lateralis.
pdma — M. pterygoideus dorsalis medialis anterior.
pdmp — M. pterygoideus dorsalis medialis posterior.
pqp — M. protractor quadrati et pterygoidei.
psp — M. pseudotemporalis profundus.
pss — M. pseudotemporalis superficialis.

M. adductor mandibulae externus (M.a.m.e.)

T. poliothorax: M.a.m.e. rostralis temporalis has a very small area of origin, and shows no clear separation from the lateralis portion. M.a.m.e. rostralis medialis and rostralis lateralis are closely united and extend equally far anteriorly.

Other species: M.a.m.e. rostralis temporalis extends markedly further posteriorly at the origin, and is clearly separated from the lateralis portion by a well marked groove. M.a.m.e. rostralis medialis extends less far anteriorly than M.a.m.e. rostralis lateralis, and is slightly separated from it anteriorly, giving the impression of a distinct slip.

M. pterygoideus (M.pt.)

T. poliothorax: M.pt. dorsalis lateralis is separated medially by a clear groove from M.pt. dorsalis medialis anterior, but does not overlap it. M.pt. dorsalis medialis posterior has origin along the full length of the anterolateral and posterolateral surfaces of the pterygoid. The fibres of M.pt. dorsalis medialis anterior fan out evenly from their insertion on the medial surface of the mandible as seen in dorsal view.

Other species: The medial edge of M.pt. dorsalis lateralis overlaps M.pt. dorsalis medialis anterior substantially, though still leaving much of it exposed to dorsal view. M.pt. dorsalis medialis anterior is smaller than in *poliothorax*, its anterior origin being confined to the posterior half of the anterolateral surface of the pterygoid, though posterior fibres originate along the whole length of the postero-lateral surface. M.pt. dorsalis medialis anterior shows distinct bipinnate structure in dorsal view, with fibres diverging from a raphe of insertion—most strongly so in *tickelli* and least well defined in *bicolor*.

Feet

The pads and the folds on the feet have already been studied in a number of European passerine species by Lennerstedt (1973, 1974, 1975 a, b, c) and his methods and terminology are followed here. One specimen of *poliothorax* (Kenya) and singles of *Trichastoma tickelli* (Malaya), *T. malaccense* (Malaya), *T. rostratum* (Malaya), *T. bicolor* (Malaya), *T. pyrrhopterum* (Kenya), *T. albipectus* (Zaire) in the spirit collection of the British Museum were studied.

The plantar surface of the foot has pads (extensive raised areas) and folds (narrow raised areas) which are separated by furrows. Pads and larger folds have papillae, whereas the smaller folds may lack them. The papillae in the pads are mostly smaller and more pointed than the papillae in the folds, indicating that the papillae in the pads are regularly in contact with the substrate. The pads, folds, furrows and papillae appear during the first half of embryonic life (Lennerstedt 1973) and they are as characteristic as other morphological features, e.g. those of the skeleton.

The contour of the pads and folds and the profile of the claws were drawn on paper using a stereo microscope with a camera lucida apparatus. The paper was cut along the contour of the pad and the size of the pad was calculated from the weight of the piece of paper. The papillae in the pad were counted and the average size of the papillae in the pad was calculated. This is the size of the base of the papillae, not of the top of the papillae, the structure of which may vary with season (Lennerstedt 1975c).

The 6 typical species of *Trichastoma* studied have a similar pattern of pads and folds in the feet and the minor differences between them can be explained as individual variation within any of the species (Lennerstedt 1975a). However, *poliothorax* differs substantially from all the others, and for the following treatment can be compared with *T. rostratum* representing the 6 species of *Trichastoma*.

The pads and folds in *T. rostratum* and *poliothorax* are shown in Fig. 4. Eight areas with differences between the 2 species (A–H) are described in Table 2.

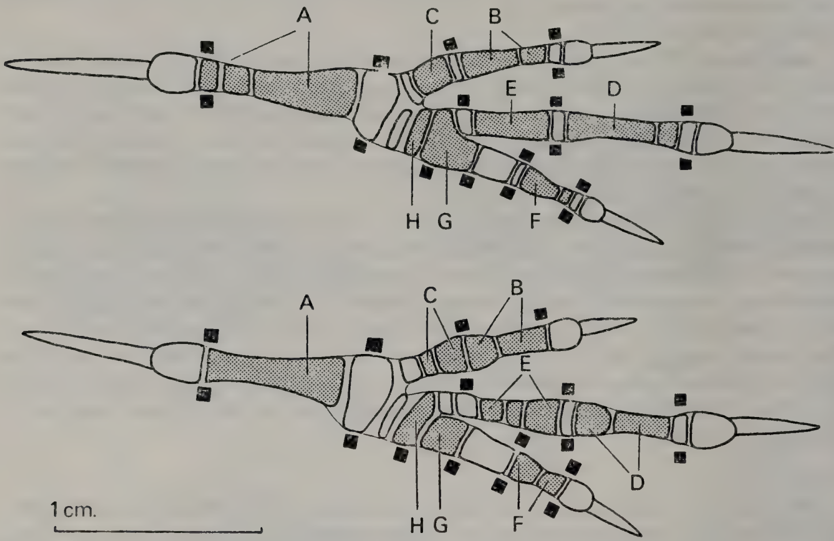

Fig. 4. Plantar surface of the foot in *T. rostratum*, upper and *T. poliothorax*, lower. Pads and folds referred to in Table 2 are shaded and lettered.

In general *rostratum* has more folds than *poliothorax*. This implies that the pads in *poliothorax* lie closer to each other, particularly at the joints. A functional implication of this may be that the digits in *rostratum* may be more strongly curled around small twigs than in *poliothorax*.

The following pads are divided into 2 in *poliothorax*: pad II:2, III:2, III:3, and IV:2. One of the parts is broad and the other more narrow. This means that the parts of the pad have become specialised. A similar division does not occur in *rostratum*.

The basal phalanges of the anterior digits differ between the species. *T. rostratum* has phalanx II:3 and III:4 substantially shorter than phalanx II:2 and III:3 respectively; *poliothorax* has phalanx II:3 and III:4 about similar length to II:2 and III:3 respectively. *T. rostratum* has phalanx IV:5 longer than IV:4, whereas *poliothorax* has the 2 phalanges about equal length. Almost nothing is known about how passerines use the phalanges as levers in grasping twigs and in standing on the ground. The different proportions of the phalanges, however, must imply differences in the ability to perform these tasks.

TABLE 2

Comparison of foot pads and folds in *T. rostratum*, including *poliothorax* (see Fig. 4).

	T. rostratum	*T. poliothorax*
	DIGIT I	
A.	Pad I:2 narrowing, ended with 2 folds.	Pad I:2 is narrowest in the middle part; no fold distal to the pad.
	DIGIT II	
B.	Pad II:2 narrowing distally, ended with 2 folds.	Pad II:2 divided into one broad basal and one narrow distal part; no fold distal to the pad.
C.	Pad II:3 has typical muscicapid form; basal to it is a narrow fold.	Pad II:3 is comparatively small, the pad lying near joint II:2/3; basal to it are 2 comparatively large folds.
	DIGIT III	
D.	Pad III:2 narrowing distally, ended with 2 folds.	Pad III:2 divided into one broad basal part and one narrow distal part, ended with one fold.
E.	Pad III:3 is long, rectangular.	Pad III:3 divided into one broad distal part and 2 narrow basal parts with papillae as in the folds.
	DIGIT IV	
F.	Pad IV:2 narrowing distally, ended with 2 folds.	Pad IV:2 divided into 2 about equal large parts; no fold distal to the pad.
G.	Pad IV:4 is longer than phalanx IV:4, lying ventral to phalanx IV:4 and joint IV:4/5; pad IV:4 is joined to folds at phalanx III:4.	Pad IV:4 is shorter than phalanx IV:4, lying ventral to it.
H.	Fold IV:4/5 displaced basally, lying ventral to distal part of phalanx IV:5; the fold has papillae as other folds.	Fold IV:4/5 lies ventral to joint IV:4/5 and it has grown together with folds at phalanx III:4. The fold has papillae similar to those in the pads.

The differences in the length of phalanges correspond to differences in pads and folds and their relation to the phalanges in digits III and IV (see G and H, Table 2). Joint IV:4/5 in *rostratum* lies at the basal part of pad IV:4, but in *poliothorax* the joint lies at the fold basal to the pad, and this fold is enlarged.

A noticeable difference concerns pad II:3. *T. rostratum* has a typical II:3 with a narrow fold basal to it, whereas *poliothorax* has a comparatively small pad II:3, lying close to the joint, and 2 large folds basal to the pad. The distal of the 2 folds is probably a separated part of pad II:3. The structure of pad II:3 in *poliothorax* is analogical to the differentiation of pad II:2, III:2 and III:3.

For 8 pads, the size of pad was measured, the number of papillae counted, and the average size of papillae calculated (Table 3). The 6 species, represented

TABLE 3

Size of pad, and number and size of papillae in 7 species of *Trichastoma* including *poliothorax*.

Species	*Pad size mm²*	*Papillae number*	*Papillae size, mm²*
tickelli	32·6	437	0·075
malaccense	33·1	248	0·143
rostratum	33·3	383	0·088
bicolor	34·5	338	0·101
pyrrhopterum	35·6	307	0·116
albipectus	31·3	317	0·097
poliothorax	40·7	339	0·115

Note: Papillae size is calculated as the mean of eight pads, not as the mean of the figures in the table.

by *T. rostratum* in Fig. 4, with a similar pattern of pads and folds, are easily compared as every pad and fold in one species has an equivalent in any of the other species. The values of *poliothorax* are calculated on pads, many of which have different positions in the foot, so that they are not closely comparable with the other species, but they are of value as general information on these features.

The comparison of the species shows that *poliothorax* has the largest total area of pads. This may be explained by the lack of certain folds and the corresponding expansion of pads. In all species, the total number of papillae varies considerably, from about 250 to about 380, *poliothorax* lying within this range of variation. The average size of papillae varies according to the number of papillae, from 0·14 to 0·075 mm². In *poliothorax* the papillae are comparatively large, averaging 0·115 mm². In the number and size of papillae *poliothorax* does not deviate from *Trichastoma* species. However, *poliothorax* had pad II:2, III:2, and III:3 divided into one broad and one narrow part. The broad parts, lying close to the joint, have papillae of about 0·10 mm², whereas the narrow parts have substantially larger papillae of about 0·16 mm². The circumstances in pad IV:2 are similar. The basal part of pad IV:2 has papillae of about 0·08 mm² and the distal part of about 0·13 mm². Similar differentiation between basal and distal parts of the pad, though undivided, may be suggested in *Trichastoma* species, but the differences are insignificant. The differentiation of pad II:2, III:2, III:3, and IV:2 into 2 parts in *poliothorax* is thus accompanied by a substantial differentiation in the size of papillae.

There are many similarities between *Trichastoma* and *poliothorax*. The 6 species of *Trichastoma* show only a minor variation in the length of the digits. The lengths in *rostratum* are exactly the same as in *poliothorax*. The curvature of the claws was studied only in *rostratum* and *poliothorax*. In these 2 species, the corresponding claws have exactly the same length and curvature.

In *rostratum* the long and narrow pads are comparable to those in certain species of Turdinae, *e.g.* the European Robin *Erithacus rubecula* or the Redstart *Phoenicurus phoenicurus*. The 2 folds near the distal joint in the 4 digits are features found in many species of Sylviinae. *T. rostratum* is thus comparable to species of Muscicapidae which include the ground in their habitat. On the other hand the pattern of pads and folds in *poliothorax* does not occur in typical Turdinae or Sylviinae. Instead it is comparable to those found in wagtails, genus *Moticilla*, and pipits, genus *Anthus*, of the family Motacillidae. This does not imply phylogenetic relationship between *poliothorax* and species of the family Motacillidae, only that the pads and folds are adapted to the same type of substrate and the same way of using the digits.

The conclusion from this comparison is that the 6 *Trichastoma* species, with *T. rostratum* as a described example, are typical arboreal species of Muscicapidae which have certain adaptations to live on the ground. Although *poliothorax* also shows adaptations to live on the ground, the differences between this species and *rostratum* are profound. They indicate that *poliothorax* has an evolutionary history which has for a long time been separated from that of *Trichastoma*. The similarities between *poliothorax* and *Trichastoma* probably depend upon convergence and adaptations to similar habitats.

Vocalisations

Members of the genus *Trichastoma* usually reveal their presence by their conspicuous calls. Some duet, or sing in groups. This behaviour is recorded by C. F. M. for *T. rufipennis*, *fulvescens* and *pyrrhopterum*, and Chappuis (1975) adds *cleaveri* and *poliothorax*.

T. poliothorax has a loud, almost ringing, 7–9 note call, a common form of which could be transcribed as 'chee-wee-woo, wee-woo, wee-woo', with the second, fourth and sixth syllables stressed. It has an almost oriole-like quality. Chappuis (1975) states 'Phrase genre Turdidae ou Oriolidae.'. C. F. M. has never recorded group singing or duetting in this species, but Chappuis (1975) has published a group song from Mt. Cameroon.

Three species of *Trichastoma* (*fulvescens*, *pyrrhopterum* and *rufipennis*) sympatric with *poliothorax* in western Kenya produce fairly simple warbling songs, usually with a leader, and one or two others contributing chuckles, rattles and other harsh notes. A fourth species, *albipectus*, has a far-carrying slow series of 2–4 whistles, usually preceeded by a barely-audible warbling-chuckle. All 4 have harsh 'scurring' alarm notes, as has *poliothorax*.

A recording of *Ptyrticus turdinus* (Chappuis 1975) was considered by C. F. M. to recall that of *poliothorax*, but is clearer and louder, and even more oriole-like.

Discussion and Conclusions

Differences between *poliothorax* and typical members of *Trichastoma* in plumage and vocalisations are perhaps of no great significance, but they lend weight to our conclusion that *poliothorax* should be removed from *Trichastoma*. The unspotted immature plumage suggests that it is not a member of the Turdinae, although this is not a constant feature of the subfamily, as *Modulatrix* (Benson & Irwin 1975) and *Neocossyphus* (specimens in British Museum examined by C. F. M.) apparently have unspotted young.

Having found no close relative for the species we therefore erect a new genus, which until further evidence is available, we feel should remain within the Timaliinae:

Kakamega, gen. nov.

Type species: *Kakamega poliothorax* (Reichenow).
Diagnosis: A smallish oscine (mean weight of 16 of both sexes, 36·38 g) with the general characteristics of the tribe Pellorneini of the sub-family Timaliinae. It differs from the typical members of the genus *Trichastoma* as follows:

(a) rictal bristles much reduced;
(b) tongue longer relative to bill, and of 'U'-shaped cross-section;
(c) skull shape wider in relation to length, and more tapering;
(d) the angle in the dorsal anterior quadrant of the intersection of post-orbital ligament and jugal bar considerably greater (112° compared to 87–95°);
(e) in the structure of the jaw muscles M. adductor mandibulae externus and M. pterygoideus.
(f) in the structure of the foot pads II:2, III:2, III:3, and IV:2.
(g) in the lengths of basal phalanges in the anterior digits. (In the pattern

of pads and folds it also differs from all studied members of Sylviinae and Turdinae.)

(h) feathering finer and closer than *Trichastoma*.

(i) Vocalisations.

Acknowledgement: We are extremely grateful to C. W. Benson for his very helpful and thorough criticism of this paper.

References:

Benson, C. W. & Irwin, M. P. S. 1975. The systematic position of *Phyllastrephus orostruthus* and *Phyllastrephus xanthophrys*. Two species incorrectly placed in the family Pycnonotidae (Aves). *Arnoldia Rhod.* 7 (17): 1–10.

Chapin, J. P. 1953. The birds of the Belgian Congo. Pt. 3. *Bull. Am. Mus. Nat. Hist.* 75A.

Chappuis, C. 1975. Illustration sonore de problems bioacoustique poses par les oiseaux de la zone Ethiopienne. *Alauda* 43 (4). Supplément sonore.

Deignan, H. G. 1964. Subfamily Timaliinae. *In Checklist of Birds of the World* (Peters), vol. 10: 247–261. Mus. Comp. Zool. Cambridge, Ma.

Hall, B. P. & Moreau, R. E. 1970. *An Atlas of Speciation in African Passerine Birds*. Trustees Brit. Mus. (Nat. Hist.): London.

Keith, S., Twomey, A., Friedmann, H. & Williams, J. 1969. The avifauna of the Impenetrable Forest, Uganda. *Am. Mus. Novit.* No. 2389.

Lennerstedt, I. 1973. Pads, furrows, and papillae in the foot of birds. Thesis. Lund.

— 1974. Pads and papillae on the feet of nine passerine species. *Ornis Scand.* 5: 103–111.

— 1975a. Pattern of pads and folds in the foot of European oscines (Aves, Passeriformes). *Zool. Scripta* 4: 101–109.

— 1975b. A functional study of papillae and pads in the foot of passerines, parrots and owls. *Zool. Scripta* 4: 111–123.

— 1975c. Seasonal variation in foot papillae of wood pigeon, pheasant and house sparrow. *Comp. Biochem. Physiol.* 51A: 511–520.

Mackworth-Praed, C. W. & Grant, C. H. B. 1960. *African Handbook of Birds*. Series I, vol. 2. *Birds of Eastern and North Eastern Africa*. 2nd. edition. London: Longmans, Green & Co.

Reichenow, A. 1900. *Orn. Montas.* VIII: 6.

Richards, L. P. & Bock, W. J. 1973. Functional anatomy and adaptive evolution of the feeding apparatus in the Hawaiian honeycreeper genus *Loxops* (Drepanididae). A.O.U. Ornithol. Monogr. 15: x+173 pp.

Ripley, S. D. 1952. The thrushes. *Postilla.* No. 13: 1–48.

Ripley, S. D. & Bond, G. M. 1971. Systematic notes on a collection of birds from Kenya. *Smith. Contrib.* 111.

White, C. M. N. 1962. *A Revised Check List of African Shrikes, etc.* Lusaka: Govt. Printer.

Zimmerman, D. A. 1972. The avifauna of the Kakamega Forest, Western Kenya, including a bird population study. *Bull. Amer. Mus. Nat. Hist.* 149: 257–339.

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Vocal mimicry in the lark *Mirafra hypermetra* as a possible species-isolating mechanism

by Françoise Dowsett-Lemaire & R. J. Dowsett

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The lark *Mirafra hypermetra* is usually considered to be a good species by ornithologists in East Africa (e.g. Williams 1963: 180), but no justification for this appears to have been published. Hall & Moreau (1970: Map 7) treat *m. hypermetra* and *M. africana* as separate species, though without great conviction. In a review of *M. africana* (*sensu latu*) White (1960: 8–9) has

described the considerable differences in size, structure and colour pattern between *africana* and *hypermetra*. He considers that the race *gallarum* links the two and provides evidence for their being conspecific, which is how he treats them in his *Check List* (White 1961: 13). However, he does admit the need for more research in the field to confirm these conclusions.

During a visit to Kenya in December 1976 we found considerable differences in the vocalisations of *africana* and *hypermetra*, the latter being a very accomplished mimic.

Vocalisations

In Kenya F. D.- L. was able to make tape recordings of the songs of *africana* and *hypermetra*, using an Uher 4000 recorder. The tapes have subsequently been analysed on a Kay sonograph.

Mirafra africana. The song in Kenya consists of a succession of short whistled phrases, regularly spaced, such as those of a bird at Naro Moru near Mount Kenya (0° 10′ S, 37° 01′ E.) (Fig. 1A). Each phrase lasts about

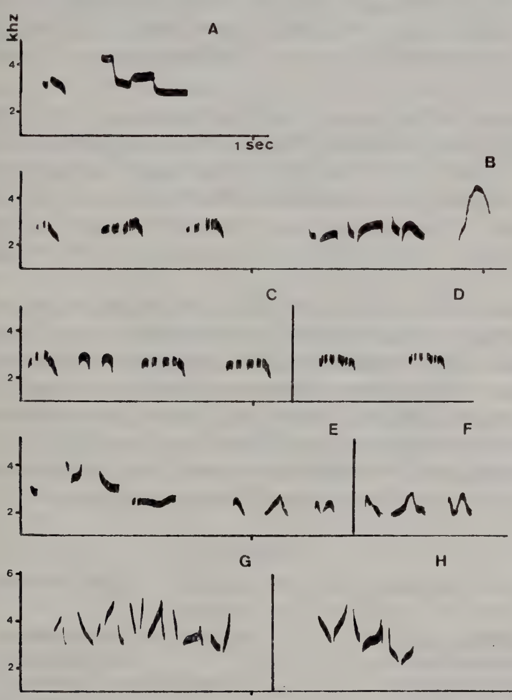

Fig. 1. The songs of *Mirafra africana* and *M. hypermetra*, recorded in Kenya. Sonograms of: (A) song (simple whistle) of *africana*; (B) a song phrase of *M. hypermetra*, preceded by imitation of three notes of *Merops superciliosus*; (C) authentic call of *Merops s. superciliosus* (Livingstone, Zambia); (D) authentic call of *M. s. persicus* (Blue Lagoon, Zambia); (E) a song phrase of *M. hypermetra*, ending with imitation of the song of *Caprimulgus donaldsoni*; (F) authentic song of *C. donaldsoni* (Kenya: Myles North); (G) authentic song of *Cisticola cinereola* (Tsavo, Kenya); (H) imitation (shortened version) of song of *C. cinereola* by *M. hypermetra*.

0·6 seconds, and is separated from the next by an interval of 2 seconds. The same phrase, very monotonous to the human ear, may be repeated 20 times or more, before the singer changes to another motif. In our experience the Kenya song is very similar to that uttered by *africana* in Zambia. (Benson (1948: 56) has reported an apparent similarity between the voices of Kenyan and Rhodesian birds.)

We did not notice any 'flappeting' by *africana* in Kenya, although we frequently observed such behaviour by territorial males of the montane race *M. africana nyikae* on the Nyika Plateau (Malawi/Zambia) in December 1977 and D. R. Aspinwall has occasionally noticed 'flappeting' by individuals of lowland races in southern Zambia. 'Flappeting' by *africana* involves a male jumping a few cm into the air from his song post and vibrating his wings, producing a short burst of sound much like that made by the lark *Mirafra rufocinnamomea*.

The song of *africana* is usually devoid of imitations, and we noticed none in Kenya. However, it has been found to mimic on rare occasions elsewhere (Took 1961, Vernon 1973), though its efforts are clearly not elaborate. The occurrence of imitation in the songs of at least 5 African species of lark (Vernon 1973) suggests that the use of mimicry may not necessarily indicate close relationship.

Mirafra hypermetra. We found this form common on 2 December on the plains of Tsavo West National Park, in the area between Mzima Springs and Kilaguni (2° 50′ S, 38° 00′ E). Males were singing from the tops of isolated thorn bushes, in a habitat in which the other dominant lark was *Mirafra albicauda*. Their voices were extremely powerful, carrying several hundred metres, and three birds we observed closely were clearly answering each other.

In contrast to the monotonous whistles of *africana*, the song of *hypermetra* is strikingly attractive and varied. In part this is due to its considerable ability to imitate other species, but its own basic repertoire is also more elaborate. Mimicry by *hypermetra* appears to receive no mention in the literature, except in passing by Lack (1977: 38). During 15 minutes tape recording we could identify imitations of 20 different species (Table 1). Most of these were later sonographed for confirmation, and each is a common bird in this part of Tsavo, 4 or 5 of them being Palaearctic migrants.

TABLE 1

Species recorded in the imitative song of *Mirafra hypermetra*

Non-Passerines:	*Passerines:*
Phasianidae: *Francolinus sephaena*	Alaudidae: *Mirafra albicauda*
Otididae: *Eupodotis ruficrista*	*M. poecilosterna*
Charadriidae: *Vanellus coronatus*	Hirundinidae: *Hirundo rustica*
Scolopacidae: *Tringa glareola*	*H. abyssinica*
Caprimulgidae: *Caprimulgus donaldsoni*	*Delichon urbica*
Coliidae: *Colius macrourus*	Sylviidae: *Cisticola cinereola*
Meropidae: *Merops superciliosus*	Malaconotidae: *Tchagra senegala*
Bucerotidae: *Tockus nasutus*	Motacillidae: *Motacilla flava*
	Sturnidae: *Spreo superbus*
	Buphagus erythrorhynchus
	Ploceidae: *Plocepasser mahali*
	Estrildidae: *Ortygospiza atricollis*

The imitations are usually very short, often less than one second, and are interspersed with notes of the proper song. Fig. 1B illustrates 3 calls of the bee-eater *Merops superciliosus* imitated by *hypermetra*, followed by its own song phrase. To demonstrate the fidelity of this imitation, sonograms C and D in Fig. 1 show respectively the calls of the Malagasy/Ethiopian nominate *Merops* and of the Palaearctic *M. s. persicus*, from recordings made in Zambia. The calls of these 2 bee-eaters appear, in fact, to be nearly identical, and lend no support to the suggestion that the 2 races should be considered separate species. Similarly, sonograms E and F show the exact copy and the genuine song of the nightjar *Caprimulgus donaldsoni*, and G and H the genuine and the exact copy of the song of the warbler *Cisticola cinereola*.

One phrase of 12 seconds from a singing *hypermetra* contained short imitations of 5 different species, mingled with the lark's own whistles. Phrases are on average noticeably longer than those of *africana*: 71 phrases from one singer lasted 1–15 secs (mean 3·8), with intervals of 1–11 secs (mean 3·0), and 70 phrases from another bird lasted 1–5 secs (mean 2·3), with intervals of 1–3·5 secs (mean 2·1). This variability in length of phrases and intervals also contributes to the overall impression of variety in the song of *hypermetra*. Moreover, phrases were not repeated in succession more than 3 or 4 times; the singer would either alter the previous motif with some variation, or switch to a completely different song phrase. Often phrases would be copied by neighbouring singers, and clearly imitation formed an important component of the song in this population. It remains to be discovered if this is the case throughout the range of *hypermetra*.

Ecological allopatry

We have not reinvestigated the question of subspecific limits within *Mirafra africana* (*sensu latu*), which have been discussed in detail by White (1956, 1959, 1960, 1961); but with the exception of the possibly anomalous *gallarum* (skins of which seem to us to be closest to *hypermetra*) and *kathangorensis*, there seems little evidence to warrant uniting *hypermetra* and *africana* specifically. Even in a family in which morphological characters are greatly influenced by environment, the differences in size and structure, and the distinctive chest markings of *hypermetra* (clearly visible in territorial males), should normally be enough to warrant their specific separation. Songs may be even more important as species-isolating mechanisms, and our observations suggest that those of *hypermetra* and *africana* are so dissimilar as to preclude interbreeding.

At Naro Moru near Mount Kenya we thought we saw and heard *hypermetra* on 4 December: the bird was large, with strikingly clear chest patches and a varied, imitative song. Although this is at a considerably higher altitude than *hypermetra* has been reported before (c 2000 m), it was in dry scrub vegetation. Unfortunately we could not find this bird again to tape record it next day, but only 800 m distant we found a typical male *africana* in song, to which we played a brief tape of *hypermetra* song, but with no significant response. The possibility of sympatry in this area needs to be investigated further.

Normally *hypermetra* is found at a lower altitude than *africana*, on semi-a plains with scattered thorn bushes, from the tops of which it sings.

contrast, *africana* occurs on the cooler high-altitude grasslands, where it sings from a variety of perches and even on the ground.

White (1960: 9) has remarked on a specimen of *hypermetra* from Loliondo in Tanzania (2° 03′ S, 35° 40′ E), apparently from the same general area as *africana*, but at a lower altitude. If altitudinal segregation is found to be the rule in areas where sympatry is approached, and evidence of regular hybridisation is lacking, this would seem to argue for specific distinctness. White has pointed out that it is unusual for a low-altitude subspecies to be so much larger than adjacent highland relations; this is contrary to Bergmann's Rule, and is a further indication that we may be dealing with 2 genetically distinct forms.

Hybridisation between morphologically similar species, which normally have distinctive vocalisations, can occur if an individual male produces a mixed song (Lemaire 1977). However, occasional hybridisation under such conditions need not mean that such forms are conspecific.

Clearly more field observation is required, particularly where there is possible sympatry between *hypermetra* and *africana*, of vocalisations, the incidence of mimicry and other isolating mechanisms, especially of forms of supposed doubtful affinity, such as *gallarum*. Meanwhile, we feel that *M. africana* and *M. hypermetra* are most conveniently considered separate species.

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References:

Benson, C. W. 1948. Geographical voice-variation in African birds. *Ibis* 90: 48–71.

Hall, B. P. & Moreau, R. E. 1970. *An Atlas of Speciation in African Passerine Birds*. London: British Museum (Natural History).

Lack, P. C. 1977. The status of Friedmann's Bush-Lark *Mirafra pulpa. Scopus* 1: 34–39.

Lemaire, F. 1977. Mixed song, interspecific competition and hybridisation in the Reed and Marsh Warblers (*Acrocephalus scirpaceus* and *palustris*). Behaviour 63: 215–240.

Took, J. M. E. 1961. Imitation by *Mirafra africana. Ostrich* 32: 93–94.

Vernon, C. J. 1973. Vocal imitation by Southern African birds. *Ostrich* 44: 23–30.

White, C. M. N. 1956. Notes on African Larks—Part III. *Bull. Brit. Orn. Cl.* 76: 120–124.

— 1959. The limits of the genus *Mirafra. Bull. Brit. Orn. Cl.* 79: 163–166.

— 1960. Some inter-relationships in the larks of the *Mirafra africana* group. *Bull. Brit. Orn. Cl.* 80: 7–10.

— 1961. *A Revised Check List of African Broadbills, Pittas, Larks, Swallows, Wagtails and Pipits*. Lusaka: Government Printer.

Williams, J. G. 1963. *A Field Guide to the Birds of East and Central Africa*. London: Collins.

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Records of migrants from Grand Cayman Island

by Jon C. Barlow

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Between 23 April and 1 May 1974 Michael McNall and I studied vireos on Grand Cayman, the largest and western-most of the three Cayman Islands. In the course of our field work several noteworthy records were obtained which serve further to clarify the status of certain migratory or far ranging

birds in the western Caribbean and expand upon data in the annotated avifaunal list of Cayman Islands birds by Johnston *et al.* (1971).

CATHARTES AURA *Turkey Vulture.* One was reported as present in the northwest peninsula of the island from early Dec, moving to the east side towards the end of April. We did not see it. Johnston *et al.* threw doubt on its occurrence on Grand Cayman, mentioning that it may have been seen by English (1916).

CHLIDONIAS NIGER *Black Tern.* 10 noted at Meagre Bay Pond on 29 April. Johnston *et al.* report 4 specimens of *G. n. surinamensis* taken on Grand Cayman on 7.ix.1961 by A. Schwartz.

CHAETURA PELAGICA *Chimney Swift.* Two seen foraging above a mangrove swamp in the company of Caribbean Martins *Progne dominicensis* south of George Town in late afternoon on 28 April. Johnston *et al.* give only one record, 12 May 1965.

CERYLE ALCYON *Belted Kingfisher.* Observed daily: on 27 April, 5 were seen along a road through a mangrove swamp south of George Town. Johnston *et al.* considered it an uncommon winter visitor, previously recorded only between November and 9 April.

CATHARUS FUSCESCENS *Veery.* Two individuals (ROM 121465, ♀, skull pneumatized, granular ovary 8×4 mm, 30 g, heavy fat; ROM 121466, ♂, skull pneumatized, testis 2 x 2 mm, 26·3 g, light fat) were netted at the edge of a mangrove swamp 2 km south of George Town on 28 April. Only one previous record, one on 2.v.1970 (Johnston *et al.*).

BOMBYCILLA CEDRORUM *Cedar Waxwing.* Three seen feeding on small reddish fruits in a tree on 27 April. The first report for Grand Cayman; one was taken on Little Cayman on 29.iv.1888 (Johnston *et al.*).

VIREO A. ALTILOQUUS *Black-whiskered Vireo.* A ♂ (ROM 121454, skull pneumatized, left testis 5 x 3 mm, 15·4 g, light fat) netted on 26 April at the edge of a mangrove swamp 2 km south George Town is the first record of this race; 2 specimens not identified to race, are reported by Johnston *et al.*

V. a. barbatulus, which is phenotypically quite distinct from *V. a. altiloquus*, occurs in this part of the Caribbean on Little Cayman and Cayman Brac c 120 km to the east, and also on Cuba 290 km to the north. *V. magister caymanensis*, the Yucatan Vireo, which is resident on Grand Cayman, differs conspicuously in plumage characters from either of the races of *V. altiloquus* in question. It is most likely that ROM 121454 was vagrant from Jamaica, c 290 km to the southeast, where *V. a. altiloquus*, which is migratory, is a common breeding form.

DENDROICA CASTANEA *Bay-breasted Warbler.* A ♂ was seen on 27 April in company with a pair of Cuban Bullfinches *Melopyrrha nigra*. Only 2 other sight records are available: October 1956 and 2.v.1970 (Johnston *et al.*).

DENDROICA STRIATA *Blackpoll Warbler.* 5–10 seen daily in mangrove and drier woodland. A ♀ (ROM 121517, skull pneumatized, granular ovary 4 x 2 mm, 10·4 g, light fat) was netted on 29.iv.1974. Johnston *et al.* listed only 2 specimens, taken 20.ix.1889 and 18.iv.1892. It seems likely that the

Blackpoll is of annual occurrence, but since Johnston and others have not previously observed it in autumn, winter or spring, it may occur on Grand Cayman only briefly each year.

ICTERUS GALBULA *Northern Oriole*. On 28 April I saw a ♂ flying parallel to a secondary road passing through a mangrove swamp 2 km south of George Town. The only previous record was of a bird held briefly in captivity by Ira Thompson beginning on 5.iv.1971 (Johnston *et al.*).

Acknowledgements: I wish to thank Mr. Vernie Bernard, Chief Agricultural Officer of the Cayman Islands for permits and other aid which facilitated my studies. I am also grateful to Dr. David W. Johnston, Department of Zoology, University of Florida, for wise counsel concerning fieldwork on Grand Cayman. Mr. Ira Thompson, the resident naturalist of the Cayman Islands, gave me much benefit of his knowledge of local birds. I am especially grateful to Michael McNall, Department of Ornithology, Royal Ontario Museum, for his assistance in the field. Dr. David Barr read the manuscript and made several suggestions for improvement. Research on vireos was supported by the National Research Council of Canada Grant A3472.

References:

English, T. M. S. 1916. Notes on some birds of Grand Cayman, W. I. *Ibis* Ser. 10 (4): 17–35.
Johnston, D. W., Blake, C. H. & Buden, D. W. 1971. Avifauna of the Cayman Islands. *Quart. Jour. Florida Acad. Sci.* 34: 141–156.

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Bulletin of Zoological Nomenclature: Opinions

In continuation of *Bull. Brit. Orn. Cl.* 98, 1978: 31, and by permission of the International Trust for Zoological Nomenclature, the following Ruling is quoted as an extract from an Opinion published in *Bull. Zool. Nomencl.* affecting birds:

OPINION 1101

(*Bull. Zool. Nomencl.* 34(4), 1978: 205)

Conservation of *Geositta peruviana* Lafresnaye, 1847 and *Geositta paytae* Ménégaux & Hellmayr, 1906 (Aves).

(1) Under the plenary powers, the specific name *paytensis* Lesson, 1837, as published in the binomen *Anthus paytensis*, is hereby suppressed for the purposes of the Law of Priority but not for those of the Law of Homonymy.

(2) The following names are placed on the Official List of Specific Names in Zoology with the Name Numbers specified:

(a) *peruviana* Lafresnaye, 1847, as published in the binomen *Geositta peruviana* (Name Number 2627);

(b) *paytae* Ménégaux & Hellmayr, 1906, as published in the binomen *Geositta paytae* (Name Number 2628).

(3) The specific name *paytensis* Lesson, 1837, as published in the binomen *Anthus paytensis*, as suppressed under the plenary powers in (1) above, is hereby placed on the Official Index of Rejected and Invalid Specific Names in Zoology with the Name Number 1024.

These contributions will now cease; but similar résumés will continue to be published in *Ibis*.

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Papers, whether by Club Members or by non-members, should be sent to the Editor, Dr. J. F. Monk, The Glebe Cottage, Goring, Reading RG8 9AP, and are accepted on the understanding that they are offered solely for publication in the *Bulletin*. They should be typed on one side of the paper, with double-spacing and a wide margin, and submitted with a duplicate copy **on airmail paper.**

Scientific nomenclature and the style and lay-out of papers and of References should conform with usage in this or recent issues of the *Bulletin*, unless a departure is explained and justified. Photographic illustrations, although welcome, can only be accepted if the contributor is willing to pay for their reproduction.

An author wishing to introduce a new name or describe a new form should append *nom.*, *gen.*, *sp.* or *subsp. nov.*, as appropriate, and set out the supporting evidence under the headings "Description", "Distribution", "Type", "Measurements of Type" and "Material examined", plus any others needed.

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Only Members of the British Ornithologists' Union are eligible to join the Club: applications should be sent to the Hon. Treasurer, Mrs. D. Bradley, 53 Osterley Road, Isleworth, Middlesex, together with the current year's subscription (£5·50). The remittance and all other payments to the Club should always be in *sterling* unless an addition of 80p is made to cover bank charges for exchange, etc. Payment of subscription entitles a Member to receive all *Bulletins* for the year. Changes of address and revised bankers' orders or covenants (and any other correspondence concerning Membership) should be sent to the Hon. Treasurer as promptly as possible.

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CORRESPONDENCE

Correspondence about Club meetings and other matters not mentioned above should go to the Hon. Secretary, R. E. F. Peal, c/o B.O.U., Zoological Society, Regent's Park, London NW1 4RY.

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BULLETIN

of the

BRITISH ORNITHOLOGISTS' CLUB

EDITED BY

DR. J. F. MONK

Volume 99
1979

PRICE: SEVEN POUNDS FIFTY PENCE

PREFACE

It is satisfactory to report that Volume 99 has contained 156 pages despite the prospect of the considerable extra costs of the centennial number in March 1980. Since the latter will contain many references to those prominent in Club affairs in the past, the list of office holders since the Club's foundation is being published this year with the Index.

The Club continues to owe an important debt to Mr. and Mrs. C. W. Benson for their meticulous compilation of the Index. We are also grateful to the Hon. Secretary and the Hon. Treasurer for the list of changes in membership. This year we have started again, for the record, to list the names of persons attending the dinners, not always the simple task this might appear and we have to thank the Hon. Secretary for his discernment of near-illegible signatures and his perceptive recollection of members' and guests' names.

I continue to be most grateful to referees, the authors themselves and the printers, all of whom have made the Editor's work an easier pleasure by their understanding and toler ance of errors and delays.

JAMES F. MONK

COMMITTEE

1978–1979

P. Hogg, *Chairman* (1977)
Dr. G. Beven, *Vice-Chairman* (1977)
Dr. J. F. Monk, *Editor* (1976)
R. E. F. Peal, *Hon. Secretary* (1971)
Mrs. D. M. Bradley, *Hon. Treasurer* (1978)
C. E. Wheeler (1975)
B. Gray (1977)
C. F. Mann (1977)
P. J. Oliver (1978)

1979–1980

P. Hogg, *Chairman* (1977)
Dr. G. Beven, *Vice-Chairman* (1977)
Dr. J. F. Monk, *Editor* (1976)
R. E. F. Peal, *Hon. Secretary* (1971)
Mrs. D. M. Bradley, *Hon. Treasurer* (1978)
B. Gray (1977)
C. F. Mann (1977)
R. D. Chancellor (1979)
J. G. Parker (1979)

LIST OF MEMBERS: AMENDMENTS UP TO 31st DECEMBER 1979

(Compiled by Mrs. D. M. Bradley and R. E. F. Peal)

New Members

Alder, J. R., b.sc., P.O. Box 233, Zomba, Malawi.
Beal, Major N. A. G. H., r.m., Dunkery, Church Road, Hythe, Kent. (Member 1946–1951).
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Betton, K. F., Ryan Lodge, 13 St. James's Road, Hampton Hill, Middlesex TW12 1DH.
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Brown, R. J., RMB 253 QMS, Manjimup, W. Australia 6258, Australia.
Browne, P. W. P., b.sc., Nations Unies, B.P. 620, Nouakchott, Mauritania.
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Chancellor, R. D., 150b Boltons Gardens, London, SW5.
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Frusher, D. M., 211 Greenford Road, Greenford, Middlesex UB6 8QY.
Goodall, Mrs. A. L., m.i.biol., 3 Kettleby View, St. Helen's Park, Brigg, Humberside DN20 8UD.
Hanmer, Mrs. Dale B., b.sc., Sucoma, Private Bag 50, Blantyre, Malawi.
Harper, W. G., m.sc., 8 Winton Grove, Edinburgh EH10 7AS.
Harrison, Dr. Pamela F., f.r.p.s., Merriewood, St. Botolph's Road, Sevenoaks, Kent TN13 3AQ. (Associate Member 1954–1978).
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Holcombe, A. J., m.a., 7 The Ridgeway, Tonbridge, Kent.
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Noble-Rollin, C., Greystones, Glanton, Alnwick, Northumberland NE66 4AH.
Oba, Miss Teruyo, 8–1–31 Sakurasama Zushi, Kanagawa, Japan.
Peckover, W. S., P.O. Box 783, Port Moresby, Papua New Guinea.

PRICE, R. C., LL.B., 9 Hauteville Court Gardens, Stamford Brook Avenue, London, W.6.

QUICKELBERGE, C. D., East London Museum, 319 Upper Oxford Street, East London 5201, S. Africa.

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SELLAR, P. J., B.SC., M.I.E.E., 89 Riddlesdown Road, Purley, Surrey CR2 1DH.

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SHARROCK, J. T. R., PH.D., Fountains, Park Lane, Blunham, Bedford MK44 3NJ.

SIPHRON, J. R., 50 East 72nd Street, New York, NY 10021, U.S.A.

STATHAM, S. A. H., c/o Kemp-Gee & Co., 20 Copthall Avenue, London, EC2.

THOMAS, Mrs. B. T., B.A., Apartado 80844, Caracas 108, Venezuela.

THOMPSON, K. V., F.C.A., Broadview, Belgrave Road, Ventnor, Isle of Wight.

THORPE, Prof. W. H., F.R.S., SC.D., Jesus College, Cambridge. (Member 1924–1936, 1955–1970).

WALKER, R. L., 5 Beech Avenue, Hulland Ward, Ashbourne, Derbyshire DE6 3FF.

WOOD, C. R., Whych wood, Buddle Hill, North Gorley, nr. Fordingbridge, Hants.

YAMASHINA, Dr. Yoshimaro, c/o Yamashina Institute for Ornithology, 8–20 Nampeidai-machi, Shibuya-ku, Tokyo, 150 Japan. (Member 1939–1947).

Resignations

FORRESTER, R. W.; FURNISS, Dr. W. T.; HEIGHAM, J. B.; IRWIN, M. P. S.; KENDALL, Dr. Marion D.; LEWIS, Dr. A. D.; LOCK, Dr. J. M.; OATLEY, T. B.; ORTON, D. A.; PARROTT, J. R.; PAYNE, M. R.; RIDLAND, J. R. J.; SUGG, M. St. J.; TOOK, J. M. E.; WAYRE, P.; WHEATER, R. J.

Removed from Membership

AL-AZZAWY, B. M.; BUNTING, G. C.; COLE, L. R.; COLLIER, G.; COOK, S. G.; DAWSON, L. R.; DE NAUROIS, Prof. R.; DOOREMANS, H. P.; FARRAND, J., Jnr.; MAHER ALI, A.; MORRISON, Dr. R. G.; O'MAHONY, B.; WAITE, R. K.

Deaths

The Committee much regrets to record the deaths of the following Members:–

Dr. D. A. BANNERMAN, O.B.E., M.A., SC.D., LL.D., F.R.S.E. (Editor 1914–1915, Hon. Secretary and Treasurer 1918–1919, Chairman 1932–1935, Vice-Chairman 1939–1940)

Mr. C. S. BARLOW,

Lady Gwendolin CHADWYCK-HEALEY

Dr. F. GUDMUNDSSON

Baron Charles M. G DE WORMS, PH.D., F.R.I.C.

OFFICERS OF THE BRITISH ORNITHOLOGISTS' CLUB PAST AND PRESENT

Chairmen

P. L. Sclater	1892–1913	Dr. J. M. Harrison	1946–1950
Lord Rothschild	1913–1918	Sir Philip Manson-Bahr	1950–1953
W. L. Sclater	1918–1924	Col. R. Meinertzhagen	1953–1956
H. F. Witherby	1924–1927	C. W. Mackworth-Praed	1956–1959
Dr. P. R. Lowe	1927–1930	Capt. C. R. S. Pitman	1959–1962
Maj. S. S. Flower	1930–1932	Maj.-Gen. C. B. Wainwright	1962–1965
Dr. D. A. Bannerman	1932–1935	R. S. R. Fitter	1965–1968
G. M. Mathews	1935–1938	Dr. J. F. Monk	1968–1971
Dr. A. Landsborough Thomson	1938–1943	Sir Hugh Elliott	1971–1974
D. Seth-Smith	1943–1946	J. H. Elgood	1974–1977
		P. Hogg	1977–

Vice-Chairmen

Lord Rothschild	1930–1931	Dr. J. M. Harrison	1945–1946
W. L. Sclater	1931–1932	Sir Philip Manson-Bahr	1946–1947
H. F. Witherby	1932–1933	B. G. Harrison	1946–1947
G. M. Mathews	1933–1934	Lt.-Col. W. P. C. Tenison	1947–1948
N. B. Kinnear	1934–1935	Miss E. M. Godman	1947–1948
H. Whistler	1935–1936	Col. R. Meinertzhagen	1948–1949
D. Seth-Smith	1936–1937	Maj. A. G. L. Sladen	1948–1949
Col. R. Sparrow	1937–1938	Col. R. Meinertzhagen	1949–1953
Dr. G. Carmichael Low	1938–1939	E. M. Nicholson	1953–1956
Hon. Guy Charteris	1938–1939	Capt. C. R. S. Pitman	1956–1959
W. L. Sclater	1939–1940	Mrs. B. P. Hall	1959–1962
Dr. D. A. Bannerman	1939–1940	R. S. R. Fitter	1962–1965
Capt. C. H. B. Grant	1940–1943	Dr. J. F. Monk	1965–1968
B. W. Tucker	1940–1943	Sir Hugh Elliott	1968–1971
F. J. F. Barrington	1943–1945	J. H. Elgood	1971–1974
Dr. E. Hopkinson	1943–1945	P. Hogg	1974–1977
C. W. Mackworth-Praed	1945–1946	Dr. G. Beven	1977–

Editors

R. Bowdler-Sharpe	1892–1904	Dr. G. Carmichael Low	1940–1945
W. R. Ogilvie-Grant	1904–1914	Lt.-Col. W. P. C. Tenison	1945–1947
Dr. D. A. Bannerman	1914–1915	Capt. C. H. B. Grant	1947–1952
D. Seth-Smith	1915–1920	Dr. J. G. Harrison	1952–1961
Dr. P. R. Lowe	1920–1925	J. J. Yealland	1962–1969
N. B. Kinnear	1925–1930	C. W. Benson	1969–1974
Dr. G. Carmichael Low	1930–1935	Sir Hugh Elliott	1974–1975
Capt. C. H. B. Grant	1935–1940	Dr. J. F. Monk	1976–

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Howard Saunders	1892–1899	Dr. Philip Gosse	1919–1920
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H. F. Witherby	1904–1914	C. W. Mackworth-Praed	1922–1923
Dr. P. R. Lowe	1914–1915	Dr. G. Carmichael Low	1923–1929
C. G. Talbot-Ponsonby	1915–1918	C. W. Mackworth-Praed	1929–1935
Dr. D. A. Bannerman	1918–1919		

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Dr. A. Landsborough Thomson	1935–1938	Miss G. M. Rhodes	1950
C. R. Stonor	1938–1940	N. J. P. Wadley	1950–1960
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Dr. G. Carmichael Low	1943–1945	Dr. J. G. Harrison	1962–1964
Lt.-Col. W. P. C. Tenison	1945–1947	C. J. O. Harrison	1964–1965
Capt. C. H. B. Grant	1947	M. W. Woodcock	1965–1969
W. E. Glegg	1947–1949	D. R. Calder	1969–1971
		R. E. F. Peal	1971–

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C. W. Mackworth-Praed	1935–1936	P. Tate	1962–1974
Maj. A. G. L. Sladen	1936–1942	M. St. J. Sugg	1974–1978
Miss E. P. Leach	1942–1949	Mrs. D. M. Bradley	1978–
C. N. Walter	1950–1962		

LIST OF AUTHORS AND CONTENTS

INDEX TO SCIENTIFIC NAMES

(Compiled by C. W. Benson and F. M. Benson)

All generic and specific names (of birds only) are indexed. Subspecific names are included only if new and are also indexed in bold print together with the generic and specific names.

Corrigenda

p. 2, line 1: '1978', not '1977'
p. 7, lines 26, 27: '*sephaena*', not '*saphaena*'
p. 16, line 17: '*Haliaeetus*', not '*Haliaetus*'
p. 18, line 3: '*zonurus*', not '*zornurus*'
p. 19, line 11: '*Laniarius*', not '*Laniarus*'
p. 19, line 29: '*pallidus*', not '*pallida*'
p. 23, line 14: '*Myiophobus*', not '*Myiphobus*'
p. 23, line 44: '*Tangara*', not '*Tanagra*'
p. 34, line 10: '*melanoleuca*', not '*melanoleucus*'
p. 34, line 36: '*smithii*', not '*Smithii*'
p. 36, line 21: '*Turdus libonyanus*', not '*T. libonyanus*'
p. 36, line 41: '*caprius*', not '*caprins*'
p. 41, line 8: '*sechellensis*', not '*seychellensis*'
p. 41, line 9: '*sechellarum*', not '*seychellarum*'
p. 66, line 40: '*cuvieri*', not '*cuvierii*'
p. 77, line 5: 'Williams, J. G.', not 'Williams, G. E.'
p. 77, line 9: '*flavirostris* Sclater', not '*flavirostis* Schlater'
p. 113, line 12: '*Verreauxia*', not '*Verrauxia*'
p. 141, line 16: '*Artomyias*', *not* '*Artymyias*'
p. 141, line 21: '*Myopornis boehmi*', not '*Myiopornis bohmi*'. Also to precede *Myioparus plumbeus*
p. 141, line 23: '*griseigularis*', not '*griseogulare*'
p. 141, line 34: '*Dryoscopus*', not '*Drysocopus*'
p. 141, line 47: '*pelzelni*', not '*plezelni*'
pp. 146–152: See p. 110, line 2, '*Paradisea*', neither '*Paradisaea*' nor '*Paraidsaea*'
p. 146, line 3: '*Neoparadisea*', not '*Neoparadisaea*'
pp. 147–151: '*Ptiloris*', not '*Ptilorhis*'
p. 151, Group B, 6, 7: '*guilielmi*', not '*guilelmii*'
p. 151, Group B, 8: '*gulielmitertii*', not '*gulielmi-tertii*'
p. 151, Group E, 23: '*Neoparadisea*', not '*Neoparadisaea*'

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Bulletin of the

British Ornithologists' Club

Edited by

Dr. J. F. MONK

Volume 99 No. 1 March 1979

FORTHCOMING MEETINGS

Tuesday 24 April 1979 at 6.30 p.m. for 7 p.m. in the Senior Common Room, South Side, Imperial College, Prince's Gardens, S.W.7. Dr. D. B. Peakall (Chief, Wildlife Toxicology Division, Canadian Wildlife Service) on Toxic chemicals and some fish-eating birds. Those wishing to attend should send a cheque for £3.85 a person together with their acceptance on the enclosed slip to Mr. B. Gray, 5 Salem Road, London W2 4BU to arrive not later than first post on Thursday 19 April 1979.

Tuesday 15 May 1979 at 6.30 p.m. for 7 p.m. in the Senior Common Room, South Side, Imperial College, Prince's Gardens, S.W.7. Dr. B. Stonehouse on Penguins and loss of flight in birds. Those wishing to attend should send a cheque for £3.85 a person together with their acceptance on the enclosed slip to Mr. B. Gray, 5 Salem Road, London W2 4BU to arrive not later than first post on Thursday 10 May 1979.

Tuesday 10 July 1979 at 6.30 p.m. for 7 p.m. at the Goat Tavern. Mr. W. G. Harvey on "Ornithology in Indonesia", including aspects of conservation.

Tuesday 18 September 1979 at the Senior Common Room, South Side, Imperial College. Mr E. F. J. Garcia on "The Birds of Gibraltar".

Tuesday 20 November 1979. Mr. M. E. J. Gore on "Birds of The Gambia".

No liability is accepted for any damage, injury or loss suffered by any person in connection with attendance at a Club meeting.

GIFTS OR OFFERS OF SALE OF UNWANTED BACK NUMBERS OF *The Bulletin* ARE ALWAYS WELCOME

Bulletin of the BRITISH ORNITHOLOGISTS' CLUB

Vol. 99 No. 1 Published: 6 April 1979

ANNUAL GENERAL MEETING

The eighty seventh Annual General Meeting of the British Ornithologists' Club will be held in the Senior Common Room, South Side, Imperial College, Prince's Gardens, London, S.W.7 at 6 p.m. on Tuesday 15 May 1979.

AGENDA

1. Minutes of the last Annual General Meeting (*Bull. Brit. Orn. Cl* 98: 33–36)
2. Report of the Committee and Accounts for 1978.
3. The *Bulletin*.
4. Election of Officers.
   The Committee proposes that:—
   (a) Mrs. Diana Bradley be re-elected Hon. Treasurer.
   (b) Mr. R. E. F. Peal be re-elected Hon. Secretary.
   (c) Mr. R. D. Chancellor be elected a member of the Committee *vice* Mr. C. E. Wheeler, who retires by rotation.
   (d) Mr. J. G. Parker be elected a member of the Committee *vice* Mr. P. J. Oliver, who is resigning.
5. Any other business of which notice shall have been given in accordance with Rule (7).

By Order of the Committee,
RONALD E. F. PEAL
Honorary Secretary.

REPORT OF THE COMMITTEE FOR 1978

Hon. Secretary's report

Inflation was in 1978, yet again, the dominating factor affecting the Club and printing costs rose by 9% at the beginning of the year and 10% in May, making a cumulative overall increase of 20%. As printing costs are far the largest item of expenditure of the Club, it was decided regretfully by the Committee in July that the subscription rate for members must be raised to £5.50 and for *Bulletin* subscribers to £7.50, commencing in 1979.

Seven meetings were held in the year. The November meeting was enlarged into a joint meeting with the British Ornithologists' Union and an extra meeting was held in December so that we could have a speaker whom we had hoped to hear earlier in the year. The March, July and December meetings were held at the Goat Tavern, with dinner charges of £2.60 to £2.70 a head. In January, May and September meetings were held in the Senior Common Room, South Side, Imperial College, with dinner charges of £3.75 to £3.90 and the November meeting, with two speakers in a lecture theatre at Imperial College and a buffet supper in the Senior Common Room, South Side, at a charge of £3. The total number of club members and guests attending meetings was 203; the different pattern of meetings in November and December prevents direct comparison with numbers in previous years, but before then attendances were 2 more than in 1977.

During 1977 25 new members joined, 4 members resigned and 11 had their membership terminated under Rule (4). It is with deep regret that the Committee reports the deaths of Mr. L. E. G. Adams, Dr. J. G. Harrison, O.B.E., M.R.C.S., L.R.C.P., D.R.C.O.G. (Editor 1952–1961, Hon. Secretary 1962–1964), Miss G. M. Rhodes (Hon. Secretary 1949–1950), Dr. B. B. Roberts, Ph.D., Dr. Alexander Wetmore and Mr. C. M. N. White, M.B.E., M.A. The number of paid-up members at the end of the year was 301 (including 7 honorary life members); there were 10 new non-member subscribers to the *Bulletin* in the year and a total of 141 paid-up when the year ended.

In view of the international nature of the *Bulletin* and of the spread of subjects which it is the endeavour of the Committee to cover with appropriate speakers of high standing at meetings, it is interesting to note the areas in which members and *Bulletin* subscribers reside. Of members, 176 have United Kingdom addresses and 125 live abroad. In the case of *Bulletin* subscribers, 14 are in the U.K., 33 in other parts of Europe (11 in West Germany), 58 in America, 16 in Africa, 11 in Australia and New Zealand and 9 in Asia. In the U.S.A. there are 49 *Bulletin* subscribers, of which 41 are Universities, whereas in Britain there are only two Universities (Bristol and Nottingham) subscribing (Oxford and Cambridge have copyright libraries entitled to free copies).

Editor's report

Volume 98 of the *Bulletin* contained 146+xvi pages. Delay from receipt of papers to date of publication averaged 7 months, varying from about 5 months at the beginning of the year to about 8 months by the December issue. The 39 papers averaged about $3\frac{1}{2}$ pages or 2,000 words each, but varied from less than one page to over 9 pages. There were 5 notes 'In Brief', notice of 2 books received and 2 sets of 'Opinions' quoted from the *Bulletin of Zoological Nomenclature* (through the kind services of C. W. Benson). There were 14 papers on taxonomy and descriptions of 4 new races and one new genus. Of the rest, 16 were on field observations from Afghanistan, the Arctic, Australia, Burma, Colombia, East Africa, Eritrea, Ethiopia (4), Gulf of Mexico, Mozambique, Réunion, Seychelles, the West Indies and Zambia; there were 2 each on anatomy and birds' eggs, and one each on nomenclature, parasites, food, voice and moult. Of the 43 different authors, 24 were from the U.K., 4 each from the United States and South Africa, 3 from Zambia, 2 each from France and Australia, and one each from Canada, Sweden, Malaysia and West Germany.

Hon. Treasurer's report

There has been an excess of expenditure over income of £222, due mainly to two increases in printing charges for the Bulletin. It may be noted that the cost of distribution of the Bulletin (£214 in 1978) has been separated from 'Cost of publication of the Bulletin' and has been included in 'Miscellaneous expenditure and postage'. The Hon. Treasurer's expenses were higher than usual due to extra printing and postage incurred in notifying all members about the increase in the Subscription as from January, 1979. The Hon. Treasurer would beg all members to reply to these circulars

without delay and save the Club the cost of writing several times on the same subject.

The Trust Fund (Barrington Bequest) capital has been written down to the cost of the $5\frac{1}{2}\%$ Treasury Stock 2008/2112 into which it was switched in June last; the Club placed the management of this Trust Fund in the hands of a Trust Corporation in 1958, and the Committee does not make investment decisions for this Fund.

* * * *

The Seven hundred and fifteenth Meeting of the Club was held, jointly with the British Ornithologists' Union, at Imperial College, London, S.W.7, on Tuesday 21 November 1978 at 6.30 p.m. Those present numbered about 90, of whom 42 were Members of the Club (and of the Union) and their guests. Mr. P. Hogg presided at the first session, when Mr. E. M. Nicholson, C.B. spoke on 'The role of British ornithologists in Europe' and Sir Hugh Elliott, Bt., O.B.E. at the second session, when Mr. G. Mountfort, O.B.E., spoke on 'Ornithology in south-east Asia'. A buffet supper was served in the Senior Common Room, South Side. Reports on the addresses by Mr. Nicholson and Mr. Mountfort will appear in *Ibis* Vol. 121 No. 2.

The Seven hundred and sixteenth Meeting of the Club was held at the Goat Tavern, 3 Stafford Street, London, W.1., on Tuesday, 5 December 1978 at 7 p.m. Present: *Members*—P. Hogg (*Chairman*), Dr. G. Beven, Mrs. D. M. Bradley, R. A. N. Croucher, O. J. H. Davies, J. H. Elgood, Sir Hugh Elliott, A. Gibbs, P. J. Oliver, J. G. Parker, R. E. F. Peal, P. D. W. Timms, C. E. Wheeler. *Guests*—B. Budd, J. P. C. Burgess, S. J. W. Coles, Miss M. Collard, G. Lloyd, J. L. F. Parslow, R. B. Sibson, R. H. Sibson.

Mr. J. L. F. Parslow spoke on 'The function of the R.S.P.B. in British Ornithology'. He described the development of the Royal Society for Protection of Birds in its purposes of encouraging conservation of wild birds and increasing interest in them. Among its many activities were research, which was for conservation purposes and primarily related to management of reserves or to threats to birds in specific places.

The Seven hundred and seventeenth meeting of the Club was held in the Senior Common Room, South Side, Imperial College, London, S.W.7 on Tuesday 9 January 1979 at 7 p.m. Present: *Members*—P. Hogg (*Chairman*), Dr. G. Beven, J. H. R. Boswall, Mrs. D. M. Bradley, Dr. J. Bynon, D. R. Calder, R. A. N. Croucher, O. J. H. Davies, B. Gray, A. Gibbs, P. A. D. Hollom, C. F. Mann, Dr. J. F. Monk, P. J. Oliver, R. E. F. Peal, P. S. Redman, Dr. T. J. Seller, P. D. W. Timms, C. E. Wheeler. *Guests*—Miss C. Appleby, I. Baker, Miss M. A. Barry, D. J. Bradley, J. P. C. Burgess, J. M. Calder, Miss M. Collard, D. Davenport, Mrs. A. Gibbs, Mrs. P. Hogg, Dr. A. Melland, Miss C. Monk, Mrs. J. F. Monk, R. Monk, A. R. E. Peal, Mrs. R. E. F. Peal, Miss F. E. Peal, R. G. Peal, Mrs. R. G. Peal, G. H. Searle, Mrs. G. H. Searle, P. J. Sellar.

Mr. J. H. R. Boswall spoke on 'Mutual mimics, men as birds and birds as men—an ornithological frolic'. He gave a very amusing address, which was of much interest also. He illustrated his talk with a number of instruments made for human imitation of bird voice as well as by tape recordings of man imitating bird sounds in various ways and of birds imitating man.

INCOME AND EXPENDITURE ACCOUNT
for the year ended 31st DECEMBER, 1978

	1978 £	1978 £	1977 £	1977 £
INCOME				
SUBSCRIPTIONS				
Members' Subscriptions	993		982	
Subscribers	667		688	
		1,660		1,670
INCOME TAX RECOVERED				
Deeds of Covenants	102		116	
Other	17		35	
		119		151
INVESTMENT AND DEPOSIT INCOME				
General Fund	142		81	
Trust Fund	41		49	
		183		130
RENT—*Less* EXPENSES				
Property 'Clovelly', Tring		391		339
Sales of *Bulletin*—Back Numbers		553		466
Donations		49		64
		2,955		2,820
EXPENDITURE				
Cost of Publication of Bulletin	2,528		2,321	
Reprinting Back Numbers	—		231	
Notices of Meetings	61		74	
Audit and Accountancy	40		33	
Lecture and Dinner Expenses	6		15	
Miscellaneous Expenditure and Postage	381		192	
Treasurer's Expenses	151		—	
Projector Depreciation	10		10	
		3,177		2,876
EXCESS OF EXPENDITURE OVER INCOME		£222		£56

BALANCE SHEET as at 31st DECEMBER, 1978

		1978 £	1978 £	1977 £	1977 £
GENERAL FUND					
Balance at 31st December 1977		1,736		1,792	
Less: Excess of Expenditure over Income		222		56	
			1,514		1,736
BULLETIN FUND					
Members' Donations			110		110
TRUST FUND					
F. J. F. Barrington Legacy		1,000		1,000	
Less: Loss on Sale of War Stock		555		—	
			445		1,000
			£2,069		£2,846

Represented by:—

		1978 £	1978 £	1977 £	1977 £
FIXED ASSETS					
Projector and Screen—Cost		100		100	
Less: Depreciation		80		70	
			20		30
CURRENT ASSETS					
Stock of Bulletin—Nominal Value		1		1	
Cash at Bank		908		1,285	
National Savings Bank		2,357		—	
		3,266		1,286	
Less: CURRENT LIABILITIES					
Creditors		643		550	
Subscriptions paid in advance		1,099		—	
		1,742		550	
			1,524		736
GENERAL FUND INVESTMENTS					
£100 8½% Treasury Loan (Market Value £90)	100				
Less: Reserve	20	80		80	
Thurrock Borough Council Bond (10%)	1,000			1,000	
Encashed	1,000	—	80	—	1,080
TRUST FUND INVESTMENTS					
£1,399·55 3½% War Stock			—		1,000
£880 5½% Treasury Stock 2008/12 (Market Value £414).			445		—
			£2,069		£2,846

Twenty-eight additions to Archer & Godman's 'Birds of British Somaliland and the Gulf of Aden'

by D. A. Baird

Received 19 April 1978

Archer & Godman published a 'Full List of Birds' of British Somaliland and the Gulf of Aden (1937, Vol. 1. lxxix–xci) containing 422 species and sub-species, updated and revised in Vol. 3 (1961) to contain 451 species and sub-species. Mackworth-Praed & Grant (1952, 1955) acknowledged Archer & Godman as one of the many sources of their information, referring presumably to the original 2 volumes (1937) and possibly also to unpublished notes. A number of the additional species referred to in the list which follows are recorded by Mackworth-Praed & Grant (MP.G) as occurring in Somaliland (or British Somaliland) from information presumably arising from sources other than Archer & Godman. Where this is so, mention is made in the list which follows.

Recently I have been able to write up my field notes amassed 1949–55 while in what was then the Somaliland Protectorate. My duties restricted my opportunity for field study and, as a result, I was never able to visit many parts of the Protectorate. Only once was I able to explore the juniper forests of Erigavo and the Erigavo escarpment and then only for part of one day. My acquaintance with the Gulf of Aden coast line was limited to short, though repeated, visits to the townships of Berbera and Zeilah. I never travelled in the Haud or Guban except when crossing the latter en route for Berbera from Hargeisa and I never reached Mt. Wagar and the other high plateaux. Nevertheless I was able to identify 278 species during my 6 years residence.

Gordon Clarke, with the Somaliland Scouts between 1953–56 and 1957–59, presented me in 1968 with a most excellent typescript volume of his notes in which he records 302 species, including a considerable number from parts of the country which I never had occasion to visit. Clarke's list contained 65 species not on mine and my list included 41 species not recorded by him. We were thus able, between us, to account for 343 species, 28 being additions to Archer & Godman's 1961 list, bringing their 'Full List' up to 479 species and sub-species. What follows are short notes on these 28 additional species. I have considered it unnecessary to provide a description of each bird as I was already familiar with most of them in Nyasaland (now Malawi), while in most cases Clarke's notes provide good descriptions.

Pelecanus onocrotalis White Pelican.
Clarke saw 2 on the sea at Sebawanak on 14.xii.58, conspicuous in their black and white plumage in contrast to the greyish sameness of the smaller Pink-backed Pelican *P. rufescens*.

Ardea melanocephala Black-headed Heron.
Baird saw a pair sitting in a tree at Gadkayogol, August 1952. On 19.viii.54, accompanied by his son, John Baird, he saw another pair at Bihendula.

Bubulcus ibis Cattle Egret.
Baird reported a single bird on 14.vi.52 in his garden in Hargeisa feeding

alongside a neighbour's grazing horse. It remained for several hours, appearing briefly the same evening on a nearby acacia tree. On 14.ii.54, 5–6 birds were seen at the stock watering point in the town of Berbera. John Baird saw yet another on the tug at Hargeisa on 8.viii.54.

Ardeola ralloides Squacco Heron.
Clarke saw a single bird on the mud-flats at Berbera 18.ix.56, and also reports that A. R. Tribe of the Government Forestry Dept. collected a specimen at Abassa Ga-gab (location not known) at 1300 m, 5.viii.58. Baird saw one beside a rain water pool 50 km south of Hargeisa, 9.x.52, and with John Baird saw a solitary bird on a stretch of open water at Bihendula, 19.viii.54. Three days later they saw yet another in very poor condition by a dried up rain pool at Burao and the next day found it there dead.

Ciconia ciconia European Stork.
Baird has 3 records: 22.x.51, one on a large acacia tree near his house in Hargeisa; 1.iii.52, 4 seen at Tug Dila on the Hargeisa-Boroma road; 25.viii.52, 8 somewhere (unrecorded) on the Boroma road.

Anastomus lamelligerus Open-bill Stork.
Baird saw one over the cricket ground at Hargeisa on 2.viii.52.

Plegadis falcinellus Glossy Ibis.
Clarke records 2, wild and difficult to approach, at Sebawanak 13–14 Dec, feeding in the fresh water streams. He describes them as smaller than the Sacred Ibis, generally blackish-brown, glossed oily, with black bill and feet. Baird records a single bird beside the Shaab pier at Berbera, 18.viii.54.

Francolinus rovuma Kirk's Francolin.
Where they occurred together on the Ogo, Clarke noticed that this species differed from *F. saphaena* by the stripes and/or spots on the flanks and breast being chocolate in colour in *rovuma*, cream in *saphaena*. MP.G mention the sub-species *F. r. spilogaster* occurring widely throughout British Somaliland.

Gallinula chloropus Moorhen.
Clarke saw one on a pool in the Medishe tug, 27.v.56. A. R. Tribe, who was with him, claimed that the species bred there, having seen chicks in 1954 and 1955.

Actophilornis africanus Lily Trotter.
Baird and his son saw one at a grass-fringed water pool at Gadkayogol, 25.viii.52, probably an immature bird, as its back was not the same warm rufous colour as the flanks. It was whitish underneath and the wing tips were dark with an almost greenish hue. The top of the head and the nape were black while the face was white and the sides of the neck were yellow.

Rostratula benghalensis Painted Snipe.
Clarke collected a male at a water-hole at Bedr Wanak, 26.ix.58.

Phalaropus lobatus Red-necked Phalarope.
Clarke saw one at Sebawanak, 10.iii.58. Recorded by MP.G. as a winter visitor to the Gulf of Aden.

Larus cirrocephalus Grey-headed Gull.
Clarke collected an adult female at Berbera, 12.i.57, identification being confirmed by J. G. Williams. Now in the National Museum, Nairobi.

Streptopelia turtur Turtle Dove.
Clarke collected an immature bird at Bedr Wanak, 26.viii.58. Two were seen there on 1.x.58 and 4 days later another was seen at Adadleh.

Merops apiaster European Bee-eater.
Baird saw several while travelling between Hargeisa and Bedr Wanak 12.viii.52. Others were seen while travelling to Aubarreh on 25.viii.52 and at Sheikh, 21.viii.54.

Caprimulgus fossei Gabon Nightjar.
Baird, familiar with the call of this species in Nyasaland, is convinced that he heard it calling on a number of occasions in and around Hargeisa.

Caprimulgus aegyptius Egyptian Nightjar.
Clarke obtained a specimen at Sebawanak, 13.xii.58, subsequently identified by J. G. Williams and now in the National Museum, Nairobi.

Colius striatus Speckled Mouse-bird.
Clarke saw 6–7 in low scrubby bushes in the Horruf tug, near Boroma 3.xi.58. Tribe also reported (to Clarke) seeing them in the same locality. MP.G. mention the sub-species *hilgerti* occurring in British Somaliland.

Prodotiscus regulus Walberg's Honey-guide.
Baird saw one in the Government Secretariat compound in Hargeisa 31.vii.52, noting the characteristic 'bobbing' of the head which he had observed in Nyasaland birds.

Eremopterix leucotis Chestnut-naped Sparrow-lark.
Clarke came across a flock of 130–150 feeding on the air-field at Boroma, 24.v.58. He also collected 4 at Boroma on 28 Sep.

Oenanthe lugentoides Arabian Pied Chat.
J. G. Williams showed Baird a skin of this bird and also pointed it out to him in the ravines on the Erigavo escarpment. Williams claims that it is confined to the ravines on the escarpment above 1700 m.

Oenanthe lugubris Abyssinian Black Wheatear.
Seen by Clarke at Daloh where it occupies the summits of the escarpment. A pair with 2 fledglings, 24.v.56. Kreuger (1958) described the nest and eggs from material supplied by Tribe. MP.G. mention the sub-species *vauriei* as occurring in eastern British Somaliland.

Hirundo daurica Red-rumped Swallow.
Clarke reported 2, possibly 3, pairs at Tag'aire on the face of the escarpment below Daloh, 23–29.v.56. One pair was collected by Tribe which is now in the British Museum (Natural History). MP.G. mention the sub-species *rufula* and *scullii* occurring in British Somaliland.

Delichon urbica House Martin.
Clarke saw 10–12 on Mt. Wagar, 13–21.x.56 feeding over a glade high in the mountain along with Little and Common/Pallid Swifts. Attempts to obtain a specimen failed. MP.G. state that this species occurs throughout Eastern Africa.

Lanius senator Woodchat Shrike.
Clarke saw a female at Bogoljirreh, 5.xi.58.

Lamprotornis purpuropterus Rupell's Long-tailed Glossy Starling.
Clarke saw one at Hariff, near Hargeisa, between 19.iii.56 and 10.vi.56; and another there on 27.iii.58 which stayed around until 10.viii.58 at least. He says it frequented massive old acacia trees in the garden at Hariff. Its call was a noisy 'dar-ratt' repeated 6–8 times.

Petronia xanthosterna Yellow-spotted Petronia.
Clarke saw this bird at Sheikh, Wagar and Burao and westwards from there to Gebile.

Vidua macroura Pin-tailed Whydah.
Clarke saw about 20 in a tug-side garden at Amoud, 24.v.58, about half of them males in breeding plumage.

Acknowledgements: I am particularly grateful to my friend Gordon Clarke who has allowed me to make free use of his excellent notes, without which this exercise would scarcely have been worthwhile. I also wish to thank my son, Dr. John Baird, for allowing me access to his notes, for his helpful comments and for checking the typescript.

References:
Archer, G. F. & Godman, E. M. 1937. *Birds of British Somaliland and the Gulf of Aden.* Vols. 1–2. Gurney and Jackson: London.
Archer, G. F. & Godman E. M. 1961. *Birds of British Somaliland and the Gulf of Aden.* Vols. 3–4. Oliver and Boyd: Edinburgh and London.
Kreuger, R. 1953. Hitherto undescribed nests and eggs from British Somaliland. *Ibis* 100: 278–279.
Mackworth-Praed, C. W. & Grant, C. H. B. 1952, 1955. *Birds of Eastern and North Eastern Africa.* Vols. 1–2. Longmans: London.

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The avifauna of the exotic pinewoods of Viti Levu, Fiji Islands

by Martyn L. Gorman

Received 23 April 1978

Introduction

The volcanic island of Viti Levu is divided into 2 by mountains running north–south. These mountains interrupt the prevailing southeast winds leading to heavy rain on the windward side and leaving the leeward land dry for most of the year.

The windward, wet areas are covered in tropical rainforest, while the dry side of the island is covered in grassland with remnants of a sclerophyll forest largely removed in the 19th century.

Over the next 3 decades the Fijian vegetation will be profoundly changed by forestry practice. The rainforest will be altered, by selective felling, at an increasing rate while some 55,000 ha of grassland will be planted with the exotic *Pinus caribea*. Such forestry practice may have far reaching consequences for the avifuna of Fiji. This paper reports on the native and introduced birds of Fiji which have managed to colonise pine plantations, both those on former rainforest and those on dry grasslands.

Study areas

Pine has been planted on the Nadarivatu plateau (Fig. 1) since about 1950. The initial plantings were on the site of logged rainforest, the remaining trees of which were poisoned with arsenic. Pine has been planted in this way at various times along the valleys of the Navai, Nadala and Nukunuku and along the top of the escarpment south of Koro-O.

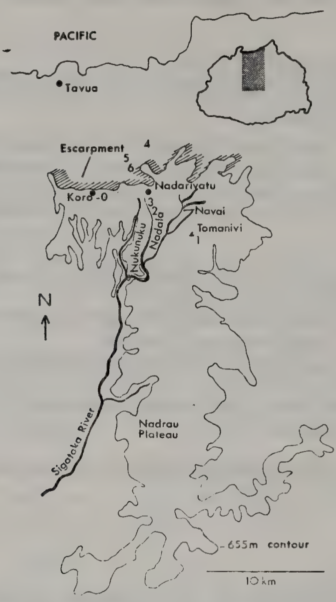

Fig. 1. Map showing the study areas 1–6. The shading on the small map of Viti Levu indicates the area covered by the large map.

In addition pine has been planted on dry grasslands where the Nukunuku joins the Sigatoka river and on the steep slopes of the escarpment leading down from Nadarivatu to the coastal plains.

I chose 4 major categories of pine: young plantations under 2 m in height in rainforest and on grassland; and mature pine more than 7 m on the same 2 vegetation types. On poisoned rainforest the young pine had a rich understorey of herbs, bushes and seedlings; the mature forest had a closed canopy and the understorey was much shorter and less diverse. On the dry land, both immature and mature pine had an understorey of grasses and shrubs. The natural vegetation surrounding these plantations is described fully in Gorman (1975).

Methods

The locations of the 6 study areas, covering the 4 categories of pine plantation and areas of natural grassland and rainforest are shown in Fig. 1. Each area was visited for a total of 31 days between November 1970 and May 1973. On each visit I walked irregularly through the area, from 6 a.m. to

10 a.m. and from 4 p.m. to 6 p.m. noting the species present on the basis of visual sightings and sound. In this way each of the 6 areas received a total of 186 hours of study. Relative abundances of the different species could not be estimated because the problems of observation varied greatly between species and between habitats.

Results

Of Vitu Levu's 55 species of birds, 47 indigenous and 8 introduced, I saw 41; their habitat occurrence is shown in Table 1.

TABLE 1

Field records of birds of Viti Levu, listed by study area (see map) to show the effect of exotic pine plantation.

	Study Area					
	Rain forest	*Former Rain forest*		*Grassland*	*Former Grassland*	
Species	1. *Virgin*	2. *Young Pine*	3. *Mature Pine*	4. *Virgin*	5. *Young Pine*	6. *Mature Pine*
Fiji Goshawk *Accipter rufitorques*	x	x		x	x	
Swamp Harrier *Circus approximans*	x			x		
Many coloured Fruit Dove *Ptilinopus perousii*	x					
Golden Dove *Ptilinopus luteovirens*	x					
Peales Pigeon *Ducula latrans*	x					
White-throated Pigeon *Columba vitiensis*	x					
Friendly Ground Dove *Gallicolumba stairii*	x					
Red-throated Lory *Vini amabilis*	x					
Collared Lory *Phigys solitarius*	x					
Musk Parrot *Prosopeia personata*	x					
Fan-tailed Cuckoo *Cacomantis pyrrophanus*	x			x		
Barn Owl *Tyto alba*	x			x		
White-rumped Swiftlet *Collocalia spodiopgia*	x	x		x	x	
White-collared Kingfisher *Halcyon chloris*	x	x	x	x	x	x
Polynesian Triller *Lalage maculosa*	x	x	x	x		x
Island Thrush *Turdus poliocephalus*	x					
Fiji Warbler *Vitia ruficapilla*	x					
Spotted Fantail *Rhipidura spilodera*	x	x	x			
Slaty Flycatcher *Mayrornis lessoni*	x					
Fiji Shrikebill *Clytorhynchus vitiensis*	x	x	x			
Black-faced Shrikebill *Clytorhynchus nigrogularis*	x					
Vanikoro Broadbill *Myiagra vanikorensis*	x	x	x	x	x	x
Blue-crested Broadbill *Myiagra azureocapilla*	x					
Scarlet Robin *Petroica multicolor*	x	x	x	x	x	x
Golden Whistler *Pachycephala pectoralis*	x	x				
White-breasted Wood-swallow *Artamus leucorhynchus*	x	x		x	x	
Polynesian Starling *Aplonis tabuensis*	x	x				
Orange-breasted Honey-eater *Myzomela jugularis*	x	x		x	x	
Wattled Honey-eater *Foulehaio carunculata*	x			x	x	
Giant Forest Honey-eater *Gymnomyza viridis*	x					
Layard's White-eye *Zosterops explorator*	x	x		x	x	
Grey-backed White-eye *Zosterops lateralis*	x	x		x	x	
Red-headed Parrot-finch *Erythrura cyanovirens*	x	x		x	x	
Pink-billed Parrot-finch *Erythrura kleinschmidti*	x					
Quail *Synoicus australis*				x		
Malay Turtle Dove *Streptopelia chinensis*				x		
Dusky Myna *Acridotheres tristis*				x	x	
Jungle Myna *Acridotheres fuscus*				x	x	
Red-vented Bulbul *Pycnonotus cafer*	x	x	x	x	x	x
Strawberry Finch *Amandava amandava*				x	x	
Java Rice-sparrow *Padda oryzivora*				x		
TOTALS	35	16	7	22	15	5

Discussion

It is clear from Table 1 that not all the birds present in rainforest manage to colonise the pine in the rainforest. In general the pigeons, parrots and lories are absent. Of the passerines, those species spread widely across the Pacific are present in the pine, while the Fijian endemics and those with restricted geographical ranges are absent. Of the introduced species only the Red-vented Bulbul *Pycnonotus cafer* has reached the Nadarivatu plateau and it is common in the pine. Comparing mature and immature pine there is a

marked decrease in the number of species present in older forest. In general the species lost are those which make use of the profuse understorey of the immature plantations—the honeyeaters, white-eyes and parrot-finch.

Most of the species present on the grasslands are also present in the young grassland pine plantations. However as the pine matures and the understorey becomes more sparse one sees again a reduction in the diversity of the avifauna. The reduction again involves the birds relying on the understory, and only the insectivorous species are left—the predatory White-collared Kingfisher *Halcyon chloris*, the Polynesian Triller *Lalage maculosa*, the Vanikoro Broadbill *Myiagra vanikorensis*, the Scarlet Robin *Petroica multicolor* and the Red-vented Bulbul *Pycnonotus cafer*.

In general, therefore the replacement of natural or semi-natural vegetation with pine leads to a progressive reduction in the diversity of the avifauna.

Acknowledgements: My expenses incurred in field work were met by research grants from the University of the South Pacific, Fiji and the British Ornithologists' Union.

References:
Gorman, M. L. 1975. Habitats of the land birds of Viti Levu, Fiji Islands. *Ibis* 117: 152–161.

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Natal pterylosis of three *Thraupis* tanagers

by J. Ingels

Received 20 June 1978

Data on natal down of tanagers (Thraupinae) are restricted to a few species only: *Piranga olivacea* (Wetherbee 1958) and *Thraupis palmarum* and *Euphonia violacea* (Collins 1963). This paper presents information on distribution and number of neossoptile sin 3 species of *Thraupis*: the Blue-grey Tanager *T. episcopus*, the Palm Tanager *T. palmarum* and the Sayaca Tanager *T. sayaca*.

Neossoptiles were counted on nestlings hatched under controlled conditions and taken from the nest within 24 hrs after hatching (stage A of Wetherbee 1957). Counts were made of damp neossoptiles under a microscope using a dissection pin as a pointer and preener. There were 5 *episcopus*, 2 *palmarum* and one *sayaca* specimens available. One breeding pair only was involved for each species. Nomenclature of pterylae follows Wetherbee (1957) but equivalent terminology of Collins (1963) for some tracts is indicated. Secondary coverts were not divided into greater, middle and lesser ones. The taxonomic arrangement is that of Peters (1970).

Neossoptiles of *sayaca*, *palmarum* and *episcopus* are blackish, dark grey and light grey respectively. An empirical impression of the total amount of natal down is: abundant in *episcopus*, moderate in *palmarum* and sparse in *sayaca*. This impression is caused by the difference in total neossoptile number, in length of neossoptiles (Table 1) and in number of barbs of each neossoptile.

All neossoptiles from these tanagers have a similar structure: a very short, reduced rachis ending in from 1 to 15 barbs with barbules. The number of

TABLE 1

Length (mm) of neossoptiles in the main pterylae of *T. episcopus* and *T. palmarum*.

Tract	*T. episcopus*	*T. palmarum*
Scapular	12–13	5–6
Spinal	10	5
Coronal	9–10	4–5
Retrices	2–5	1–2
Primaries	1	0

barbs varies considerably: primaries and rectrices have 1–2 (the shortest ones often appear bristle-like); femoral and ventral neossoptiles have 2–8; coronal, occipital, scapular, spinal and secondary covert neossoptiles have 6–15. The number of barbs in neossoptiles of a given tract increases from *sayaca*, *palmarum* to *episcopus*.

The number of neossoptiles in the different tracts and the total number of neossoptiles for 8 nestlings of the 3 *Thraupis* species are given in Table 2. Zero means that neossoptiles were sometimes absent. As in many other species, the number of neossoptiles in certain pterylae is very variable, the range increasing with the increase of nestlings examined; therefore data on the one *sayaca* nestling should be carefully interpreted.

TABLE 2

Natal down of 8 *Thraupis* nestlings.

Tract	*T. episcopus*					*T. sayaca*	*T. palmarum*	
Coronal	14/12	14/14	13/14	15/12	12/11	13/14	12/13	13/14
Occipital	4/4	4/5	4/4	5/5	4/4	4/4	5/5	4/4
Scapular (humeral)	9/8	10/8	9/9	9/10	9/9	9/9	9/10	8/9
Femoral	13/12	9/10	9/9	12/11	16/18	13/14	14/13	15/15
Abdominal (ventral)	0/0	0/0	0/0	0/0	10/10	(a)	10/10	10/11
Crural	0/4	0/0	1/4	0/0	1/0	1/2	1/1	1/2
Rectrices (caudal)	6/6	6/6	6/6	6/6	5/5	1/1	6/6	5/5
Primaries	5/5	6/9	9/8	10/9	0/0	0/0	0/0	0/0
Secondaries	0/0	0/0	0/0	4/2	0/0	0/0	0/0	0/0
Secondary coverts	15/17	16/17	17/17	20/21	16/16	18/18	18/14	14/15
Spinal	28	29	30	31	29	30	30	28
Total	162	163	169	188	175	151	177	173

(a) for the 'ventral' tract of *sayaca*, see text.

In the discussion which follows, Collins (1963) data on *palmarum* are used for comparison.

Coronal and occipital tracts.

In all 3 *Thraupis* species, 14 and 4 neossoptiles are typical for these 2 tracts respectively. In *sayaca* and *palmarum* the 2 tracts are clearly separated; however, in *episcopus* they tend to join and form one capital tract of 18 neossoptiles.

Scapular (humeral) tract.

Neossoptile numbers varied from 8 to 10 and were typically 9.

Femoral and abdominal (ventral) tracts.

Greatest variation in neossoptile numbers was found in the ventral tracts.

T. palmarum: 13–15, average 14, femoral neossoptiles and a uniserial row of on average 10 abdominal neossoptiles.

T. episcopus: The femoral tract had 9–18 neossoptiles, highly variable. Only one specimen, with abundant down, had abdominal neossoptiles (10 on each side).

T. sayaca: In *palmarum* and *episcopus* nestlings, femoral and abdominal tracts were in the typical positions (Wetherbee 1957). In the one *sayaca* nestling, the femoral tract was laterally displaced towards the caudal region: a uniserial row of neossoptiles ran from the upper

ventral region into the normal femoral region. As this may be an individual variation only, data on other nestlings are needed.

Crural tract.
Crural neossoptiles around the lower tibiotarsus were present in some nestlings of all 3 *Thraupis* species, with abundant natal down.

Caudal tract.
In *episcopus* and *palmarum* nestlings, almost all 12 rectrices bear a neossoptile. The 2 outer caudal neossoptiles only were present in the one *sayaca* nestling.

Alar tract.
Primaries and primary coverts. In 4 of the 5 *episcopus* nestlings 5–10 primary neossoptiles, were found, in contrast to the other 2 species which showed none. Primary covert neossoptiles are completely absent in all *Thraupis* nestlings.

Secondaries and secondary coverts. A few secondary neossoptiles were found in only one *episcopus* nestling, one which had abundant natal down in other tracts. In all *Thraupis* nestlings examined (Table 2) the number of secondary covert neossoptiles was more constant than numbers in other tracts. For the 3 *Thraupis* species, an average of 18 neossoptiles is typical.

Spinal tract.
This tract averages 30 neossoptiles in all 3 *Thraupis* species. A double row of 14–18 dorsal neossoptiles joins a uniserial row of 8–12 upper pelvic neossoptiles, ending in a short double row of 2–6 paired neossoptiles in the lower pelvic region.

We have tried to determine a standard neossoptile distribution pattern for each of the 3 *Thraupis* tanagers by taking a typical neossoptile number in each tract (Table 3). From these figures, our neossoptile counts of *Thraupis* seem to confirm a correlation already mentioned by Collins (1963, 1973) and Harrison (1974) between a substantial reduction in number of neossoptiles and a cavity nesting habit. In open cup nesting species (*P. olivacea* and *Thraupis* species) 'covering' neossoptiles in pterylae of the upper parts (coronal, occipital, scapular, secondary covert and spinal tracts) are more abundant than in cavity nesting species. These neossoptiles camouflage a nestling in an open nest, making it less conspicuous, thus lowering risks of predation.

TABLE 3

Natal pterylosis of 5 Thraupinae tanagers: typical numbers of neossoptiles. Pterylae with neossoptiles in a few nestlings only and numerical averages of widely varying numbers of neossoptiles are indicated with an asterisk. All tracts are 'halved', except for the spinal tract.

Tract	*Euphonia violacea* (Collins 1963)	*Piranga olivacea* (Wetherbee 1958)	*Thraupis episcopus* (this study)	*Thraupis sayaca* (this study)	*Thraupis palmarum* Collins 1973) (this study)
Coronal	1	6	14	14	14
Occipital	4	4	4	4	4
Scapular (humeral)	5	8	9	9	9
Femoral	—	13	14	14	14
Abdominal (ventral)	—	12	10*	—	10
Crural	—	7	1	1	1*
Rectrices (caudal)	—	6	6	1	6
Primaries	—	10	8*	—	—
Primary coverts	—	8	—	—	—
Secondaries	—	2	1*	—	2*
Secondary coverts	—	17	18	18	18
Spinal	12	35	30	30	30
Number of nestlings examined	1	2	5	1	4

Neossoptile distribution patterns of only 5 species of Thraupinae have been described (Table 3). Only 4 pterylae (coronal, occipital, scapular and spinal) are always present; they are all found on the upper parts. The occipital tract only has a constant number of 4/4 neossoptiles. Neossoptile numbers for wing and leg pterylae are extremely variable throughout the 5 species. This variability is found also in the natal down pattern of Tersininae, e.g. *Tersina viridis* (Collins 1973) and of other Emberizinae, e.g. *Sicalis flaveola* and *Tiaris olivacea* (Harrison 1974), *Sporophila* finches (Collins & Kemp 1976) and *Paroaria gularis* (Collins & Bender 1977).

With regard to this extreme variability within the natal pterylosis, the neossoptile distribution pattern may prove to be a taxonomic character of limited utility. Only more extensive data on the natal pterylosis of neotropical passerines may reveal any real value in establishing taxonomic relationships.

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References:
Collins, C. T. 1963. The natal pterylosis of tanagers. *Bird-banding* 34: 36–38.
— 1973. The natal pterylosis of the Swallow-tanager. *Bull. Brit. Orn. Cl.* 93: 155–157.
— & Kemp, M. H. 1976. Natal pterylosis of *Sporophila* finches. *Wilson Bull.* 88: 154–157.
— & Bender, K. E. 1977. Cervical neossoptiles in a neotropical passerine. *Bull. Brit. Orn. Cl.* 97: 133–135.
Harrison, C. J. O. 1974. Reduced natal down in some emberizine species. *Bull. Brit. Orn. Cl.* 94: 71–72.
Peters, J. L. 1970. *Check-list of Birds of the World.* Vol. 13 (R. A. Paynter, Jr., Ed.) Cambridge, Mass.: Mus. Comp. Zool.
Wetherbee, D. K. 1957. Natal plumages and downy pteryloses of passerine birds of North America. *Bull. Am. Mus. Nat. Hist.* 113: 339–436.
— 1958. New description of natal pterylosis of various bird-species. *Bird-banding* 29: 232–236.

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Morphometry, wing loading and food of western Darfur birds

by R. T. Wilson & D. M. Ball

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Darfur is known ornithologically only from the pioneering work of Admiral Lynes (Lynes 1924–1925) and some minor publications by Madden (1934, 1935, 1946). Later books with references to Darfur draw, apparently in entirety, from Lynes (Cave & MacDonald 1955, Mackworth-Praed & Grant 1960). The opportunity presented by an 18 months stay in western Darfur was taken advantage of and an effort has been made to monitor changes in the environment, the distribution and the seasonality of the avifauna which have taken place in the last 60 years. Full results have not yet been analysed. This preliminary note presents some physical data and information on food for a number of Darfur birds. Nomenclature generally follows that of White (1961–1965).

In Table 1, linear measurements are all in millimetres, wing area in square centimetres, weights in grams. Wing area was calculated from a drawn

Table 1

Morphometry, wing loading and food of western Darfur birds.

Species and Sex	*Bill length*	*Tarsus length*	*Wing length*	*Wing area*	*Total weight*	*Weight of crop/gut contents*	*Net weight*	*Wing loading*
Ardeola ibis ♀	55	83	230	972	342·5	27·9	314·6	0·352
Food items: 300–400 alate Isoptera.								
Circus pygargus ♂ imm.	16	95	315	1842	647·0	4·0	643·0	0·355
Food items: One lizard.								
Accipiter badius ♀	12	49	190	525	128·8	0·0	128·8	0·245
Melierax metabates 3♀♀	29·3±2·31 28–32	92·7±7·57 84–98	319·0±19·31 302–340	1470·3±26·39 1440–1488	597·7±27·21 580–629	9·8±11·54 0·0–22·5	587·9±32·53 557·5–622·2	0·405±0·012 0·394–0·418
Food items: Rodents, lizards, orthoptera.								
Haliaetus vocifer ♂	63	100	545	4960	2022	47	1975	0·408
Food items: Fish scales, bird bones, bird's foot, unidentified leaves, earth.								
Milvus migrans ♂	30	79	425	2324	583·6	27·5	556·1	0·239
Food items: Well digested remains of largish bird (?domestic fowl), small quantity of rodent fur and bones (shot in Zalingei town).								
Falco tinnunculus ♀	13	54	269	710	217·0	19·9	197·1	0·306
Food items: Identifiable abdomens of seven Orthoptera plus digested Orthoptera parts (17·00 hours).								
Francolinus clappertoni ♂	16	67	166	522	399·0	7·2	391·8	0·764
Food items: Formicidae (14), grass seeds (30), dicotyledon seeds (26) (10·00 hours).								
♀	17	72	165	488	414·0	5·1	408·9	0·848
Food items: Several hundred grass and dicotyledon seeds (10·00 hours).								
Numida meleagris 2♀♀					1175·0; 1177·0	3·6; 1·0	1171·4; 1176·0	
Food items: About 60% grass seeds and 40% dicotyledon seeds (16·30 hours).								
♀	19	95	260	1600	1168·0	1·1	1166·9	0·730
Food items: Sorghum seeds (15) (12·00 hours).								

Neotis denhami								
♂	72	195	545	4821	4120·0	120	4000·0	0·855

Food items: Stomach contained tightly packed mass comprised of approx. 90% Orthoptera, 4% Coleoptera, 1% Arachnid, 5% unidentified.

Columba guinea								
3♂♂	27(1)	36; 37(2)	228±3 225–231	632±59·09 566–680	346·4±56·49 312·0–411·6	9·1±2·72 6·8–12·1	337·3±57·08 303·5–403·2	0·549±0·08 0·464–0·633
2♀♀	23(1)	37; 36	233; 222	625; 590	305·1; 292·4	4·0; 17·5	301·1; 274·9	0·469; 0·496

Food items: Groundnuts in 3 birds, including complete shell, sorghum *Sorghum vulgare* in one bird, millet *Pennisetum typhoides* in one bird which had also eaten peanuts, 3 seeds of sesame *Sesamum indicum* in one bird having eaten groundnuts. The heavier female was in breeding condition on 12 ix. 1976 with 17 ovules.

20 *Streptopelia* (not including *S. senegalensis*) were taken between Oct 1976 and May 1977. The principal breeding season appeared to be Nov (rainy season June–Sep): a male and female shot on 15 Nov both had crops containing pigeon's milk and the female had one developing follicle plus 17 ovules. Millet appeared to be the preferred food being found in 75% of birds, sorghum 60%, groundnuts 20%, maize 15%, grass seeds 10%, water melon, sesame and *Lablab niger* 5%, earth 10% and snail shell in 5%; green leaves of the rainy season deciduous *Acacia albida* were found in one bird and the crop of one contained approximately equal volumes of unidentified leaves and quartz and feldspar debris. Wing loading was $0{\cdot}391 \pm 0{\cdot}04$ g/cm².

Streptopelia senegalensis								
♂	15	24	147	284	97·5	0·6	96·9	0·343
♀	15	25	135	321	90·5	0·0	90·5	0·282

Food items: Crop of male contained sorghum. Female coming into breeding condition on 15 Jan 1977.

Turtur abyssinicus								
♀	13	27	105	162	68·7	2·0	66·7	0·424
Treron waalia								
♂	14	32	181	553	250·8	11·3	239·5	0·433

Food items: Figs.

Poicephalus meyeri								
2♀♀	22; 20	21; 20	144; 139	344; 330	124·9; 113·7	7·3; 0·0	117·6; 113·7	0·363; 0·345

Food items: Pink and yellow caterpillars and yellow seeds (? *Elassus* sp.).

Psittacula krameri								
3♀♀	17·0±1·0 16–18	19·3±1·16 18–20	154·0±1·73 152–155	303·0±23·30 284–329	103·0±7·30 95·8–110·4	0·8±0·75 0–15	102·2±6·90 95·8–109·5	0·342±0·064 0·292–0·373

Food items: seeds of sorghum, millet, lentils, *Acacia albida* and *Elassus*: flesh of guava and mango. One female coming into breeding (15 ovules) on 15 Nov 1976.

Agapornis pullaria								
not sexed.	16	17	153	388	99·8	0·0	99·8	0·257

Taken on Wadi Barei (13° 00′ N, 23° 00′ E) in *Acacia albida* woodland. Not mentioned by Lynes and possibly represents an extension of range.

Species and Sex	Bill length	Tarsus length	Wing length	Wing area	Total weight	Weight of crop/gut contents	Net weight	Wing loading
Crinifer zonurus 2♀♀	32; 31	49; 52	251; 249	1007; 979	391·7; 521·5	9·5; 1·2	382·2; 520·3	0·389; 0·531
Food items: One had eaten only guava fruit and leaves. The other had seeds of millet, *Elassus* leaf (an introduced drought-resistant tree), mango flesh and 8 alate Isoptera.								
Centropus senegalensis not sexed.	28	52	178	not measured	135·4	not measured	unknown	not measured
Otus scops ♀	11	20	129	345	85·5	1·9	83·6	0·245
Food items: Mushy insect remains and gravel. Taken at dusk 19 Apr 1977. One developing follicle (15 mm) plus 9 ovules.								
Ceryle rudis ♂	52	18	145	not measured	80·7	7·3	73·4	not measured
Food items: One recently caught *Alestes* sp.								
Halcyon senegalensis ♀	43	17	112	228	57·3	0·9	56·4	0·247
Food items: Alate Formicidae.								
Coracias abyssinica ♂	28	20	162	533	102·5	—	102·5	0·192
♀	25	26	153	493	104·2	6·0	98·2	0·211
Food items: Female, taken at 15.00 hours, had caught 3 Orthoptera and 2 Coleoptera.								
Eurystomus glaucurus ♂	19	23	180	378	116·6	0·4	116·2	0·308
♀	18	25	175	382	108·5	0·2	108·3	0·284
Food items: Both birds had eaten formicids and Coleoptera.								
Phoeniculus purpureus ♂	56	29	140	347	72·2	0·6	71·6	0·208
♀	40	27	140	360	66·3	1·0	65·3	0·184
Food items: Male had taken only Coleoptera, all of which with the exception of chitinous parts (mandibles, elytra) had been digested at 15.30 hours. Female had eaten 1 Orthoptera, 3 Dermaptera, 3 Hemiptera, 1 Diptera larva and 1 rosella (*Hibiscus sabdarrifa*) flower.								
Tockus nasutus ♂	92	44	233	978	234·1	5·6	228·5	0·239
Food items: Large yellow seeds plus hard parts of ants.								

Bucorvus abyssinicus								
♀ imm. (?8 months)	178	180	555	6434	3040	136	2904	0·451
Food items: Stomach contained tightly packed mass of sorghum, groundnuts, Orthoptera, millipedes and 12 brightly coloured plastic beads. Breeds July, this one taken late Feb.								
Mesopicos goertae								
♀	19	24	110	344	42·9	0·6	42·3	0·123
Food items: Ant and caterpillar.								
Prionops cristatus								
2♀♀	17; 19	28; 31	132; 115	314; 245	50·3; 43·4	1·2; 0·3	49·1; 43·1	0·160; 0·170
Food items: Orthoptera and Coleoptera.								
Laniarus barbarus								
♂	16	36	110	372	54·9	0·6	54·3	0·147
Food items: Largely well digested unrecognisable Insecta at 16.00 hours.								
Ptilostomus afer								
not sexed.	27	55	171		127·7			
Common in Zalingei (12° 54′ N, 23° 29′ E) in Mar and Apr: probably represents a northern extension of range. Stated categorically to be not present by Lynes and previously apparently recorded only as far north as Dilling (12° 03′ N).								
Corvus albus								
♂	62	70	375	1718	594·2	7·5	586·7	0·346
2♀♀	55; 55	72; 69	379; 345	1486; 1510	491·4; 501·0	4·4; 7·5	487; 493·5	0·331; 0·334
Food items: Groundnuts only in male; egg shell and bird embryo in one female (Zalingei town) and insects, fragments of bone and quartz grains in other.								
Rhinocorax rhipidurus								
♂	60	82	400	2407	745	11·1	733·9	0·305
Food items: Shot at slaughterhouse and in addition to blood and offal had eaten sorghum.								
Turdoides plebejus								
♂	19	41	115	256	67·9	0·1	67·8	0·265
Food items: Insect remains.								
Bradornis pallida								
♀	14	31	91	147	34·3	0·5	33·8	0·230
Food items: Formicidae and mango flesh.								
Estrilda bengala								
♀	8	17	57	43	9·3	0·0	9·3	0·216
Food items: 10 grass seeds.								
Lagonosticta senegala								
♂	8	13	51	59	6·7	0·1	6·6	0·112
Food items: 50 grass seeds.								

outline of one wing either by counting squares on graph paper or by using a gravimetric method, the resulting figure being doubled to obtain total wing area: wing loading, expressed as g/cm^2, was determined as the net weight divided by the wing area. Where parametric data for a number of individuals of a species are available they are presented as the mean $\pm$ standard deviation and extremes of range. All data refer to adult, non-breeding birds, unless otherwise stated.

References:
Cave, F. O. & MacDonald, J. D. 1955. *Birds of the Sudan.* Oliver and Boyd: Edinburgh.
Lynes, H. 1924–1925. On the birds of north and central Darfur, with notes on the west-central Kordofan and north Nuba provinces of British Sudan. *Ibis*, 11th Series (6): 399–446, 648–719. 12th Series (1): 71–131, 344–416, 541–590, 757–797.
Mackworth-Praed, C. W. & Grant, C. H. B. 1960. *Birds of Eastern and North Eastern Africa.* Longmans: London.
Madden, J. F. 1934. Notes on the birds of Southern Darfur. *Sudan Notes Rec.* 17: 83–101.
Madden, J. F. 1935. The birds of Southern Darfur, Part II, Passerines. *Sudan Notes Rec.* 18: 103–118.
Madden, J. F. 1946. Bird migration at El Fasher, 1944. *Sudan Notes Rec.* 27: 221–224.

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A further note on the status of *Monticola pretoriae* Gunning & Roberts, 1911

by T. Farkas

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In his remarks on *Monticola pretoriae*, Clancey (1968) stated that this species is simply a well-marked race of *Monticola brevipes*. It seems that his opinion has been taken over without further examination of the available material, even by Hall & Moreau (1970).

The fact that *M. brevipes* shows a well-marked seasonal dimorphism, the different stages of which had earlier been misconstrued by Sclater (1930) as morphs, was first described in detail by Farkas (1962), but Clancey evidently overlooked this paper. Later, in a paper on *M. pretoriae* (Farkas 1966), I chose the lack of seasonal dimorphism in *pretoriae* as the main evidence for the reinstatement of it as a good species; this also Clancey appears not to have taken into account.

Clancey (1968) describes 2 male 'intergrades', though it is not clear why he regards these specimens as such, nor is it stated at what time of year they were collected. Certainly, as Clancey describes, the 2 specimens show some white colour on their heads, concealed by blue-grey apices; but this only qualifies them, together with a third specimen from Kosterfontein in Western Transvaal, as adult males of *M. brevipes* in different stages of their eclipse plumage. The dry Griqualand West and adjoining areas of the Orange Free State are, in any case, outside the range of *M. pretoriae* as there is no suitable habitat in that area.

The 2 'type specimens' of *M. brevipes leucocapilla* (Bangs 1930) must be considered invalid. Proof is to be found in the description in both Latin and French by Lafresnaye (1852) of a white-headed adult male of *M. brevipes*. Furthermore, the specimen to which the tag with the inscription '*leucocapilla*' is fitted today, is a plain grey-headed adult male without any trace of white, not even concealed by any blue-grey apices. I am grateful to R. A. Paynter jun. for confirming this for me. Clancey seems to have overlooked the relevant reference in my 1966 paper. It therefore seems clear that Lafresnaye's white-headed specimen must have disappeared, and its detached tag fitted to a similar-looking specimen, which by chance happened to be one of the then unknown *M. pretoriae*. Consequently, no type locality for *leucocapilla* is needed, since Clancey (1968) in any case considers *leucocapilla* to be a synonym of *brevipes*.

References:

Bangs, O. 1930. Types of birds now in the Museum of Comparative Zoology, Harvard. *Bull. Mus. Comp. Zool.* 70: 145–425.

Clancey, P. A. 1968. The status of *Monticola pretoriae* Gunning and Roberts, 1911. *Bull. Brit. Orn. Cl.* 88: 126–128.

Farkas, T. 1962. Zur Biologie and Ethologie der Gattung *Monticola* (Boie). I. Teil; *Monticola brevipes* (Waterhouse). *Die Vogelwelt* 83 (4): 97–116.

Farkas, T. 1966. Zur systematischen Stellung des Pretoria-Steinrötels *Monticola pretoriae* Gunning & Roberts. *Die Vogelwelt* 87(2): 33–48.

Hall, B. P. & Moreau, R. E. 1970. *An Atlas of Speciation in African Passerine Birds*. Brit. Mus. (Nat. Hist.): London.

Lafresnaye, F. 1852. Quelque nouvelles espèces d'oiseaux. *Rev. et Mag. Zool.* 4: 460–471.

Sclater, W. L. 1930. *Systema Avium Aethiopicarum*. Part II. Taylor and Francis: London.

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Bird weights from northeastern Argentina

by Julio R. Contreras

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This paper presents the weights of 244 specimens of birds belonging to 93 species and subspecies, collected during 3 field trips to the so called Mesopotamic Region of Argentina, which comprises the Provinces of Entre Ríos, Corrientes and Misiones. A few papers have supplied weight data of Argentine birds (Fiora 1933, 1934, Contreras 1975, Contreras & Davies 1978), but there is an almost complete lack of information about the weight of Mesopotamic birds.

Unless otherwise indicated, specimens were secured in the following localities: about the Paraná City neighbourhood (PA); in San Cosme gallery forests and swamps (SC); in the jungle, grasslands and swamps of Paso Mbaracayá, on the shore of the Paraná River (PMB); and in Estancia Ibiratingay, in the same latter kind of habitat (EIB). The first locality belongs to the Province of Entre Ríos and the last 3 to the Province of Corrientes.

The information for each specimen also includes breeding condition indicated by gonad development as a (active), i (immature or inactive). Fat condition, when significant, is mentioned. Weights were recorded to the nearest tenth of a gramme and were taken as soon as possible after death.

The nomenclature used follows Olrog (1963), with some changes advocated mainly in Meyer de Schauensee (1971) and Short (1975).

Phalacrocorax brasilianus brasilianus: ♀ a, EIB, Mar, 2008·0.

Amazonetta brasiliensis: ♀ a, EIB, Mar, 588·0.

Cathartes burrovianus: ♀ a, EIB, Mar, 1272·0.

Polyborus chimango chimango: ♂ i, PMB, Jan, 216·0.

Tringa solitaria: ♀ a, EIB, Mar, 67·5.

Gallinago gallinago paraguaiae: ♂ i, EIB, Mar, 111·0 (fat).

Porphyrula flavirostris: ♂♂ a, PMB, Jan, 103·5, 93·0.

Jacana jacana: ♂ a, Bella Vista (Corrientes), Jan, 106·5; ♂ a, PMB, Jan, 75·0; ♀ a, Isla San Martin (Corrientes), Jan, 144·0; ♀ a, EIB, Mar, 132·0.

Columba cayennensis silvestris: ♂ a, EIB, Mar, 425·0; ♂ a, Rio Victoria (Misiones), Jul, 464·0.

Columbina picui picui: ♂♂ a, EIB & PA, Jan & Oct, 47·5, 56·5; ♀ a, PA, Oct, 59·0.

Columbigallina talpacoti talpacoti: ♂ a, PMB, Jan, 52·2; ♂♂ a, EIB, Mar, 52·2, 50·5, 53·5.

Leptotila verreauxi chloroauchenia: ♂ a, PA, Sep, 185·0; ♂ i, PA, Sep, 165·0.

Leptotila rufaxilla reichenbachii: ♂ i, PMB, Jan, 169·0; ♀ a, EIB, Mar, 183·0.

Myopsitta monacha cotorra: ♀ a, EIB, Mar, 97·0; ♂♂ i, EIB, Mar, 111·0, 117·0.

Coccyzus cinereus: ♂ i, El Palenque (Entre Rios), Jan, 34·8.

Piaya cayana macroura: ♀♀ a, EIB, Mar, 119·5, 134·0, 92·0.

Crotophaga major: ♂ i, PMB, Jan, 179·0.

Crotophaga ani: ♂ i, PMB, Jan, 93·0; ♂ a, Rio Victoria (Misiones), Jul, 120·2; ♀ a, PMB, Jan, 85·5.

Guira guira: ♂ i, EIB, Mar, 126·5; ♀ a, PMB, Jan, 182·0.

Tapera naevia chochi: ♂ i, EIB, Mar, 44·0.

Athene cunicularia grallaria: ♂ i, PMB, Jan, 122·0; ♀ a, PMB, Jan, 168·0.

Caprimulgus parvulus parvulus: ♀ a, PMB, Jan, 34·0.

Chlorostilbon lucidus lucidus: ♂♂ a, PMB & EIB, Jan & Mar, 3·8, 3·7.

Hylocharis chrysura chrysura: ♂ a, PA, Sep, 4·0; ♂ i, PMB, Jan, 4·2; ♀ a, PA, Sep, 5·0.

Ceryle torquata torquata: ♂ i, Ituzaingó (Corrientes), Jan, 254·0; ♂ i, EIB, Mar, 309·0; ♀ a, EIB, Mar, 325·0.

Chloroceryle americana matthewsi: ♂ i, PMB, Jan, 35·5.

Colaptes campestroides: ♀ a, PMB, Jan, 174·0; ♀ i, PMB, Jan, 179·5.

Colaptes melanochlorus: ♂ i, EIB, Mar, 109·0.

Veniliornis passerinus olivinus: ♂ a, EIB, Mar, 30·0; ♂ i, PMB, Jan, 30·2; ♀ a, EIB. Mar, 32.0.

Lepidocolaptes angustirostris: ♂ a, EIB, Mar, 27·8; ♂ i, PMB, Jan, 30·2; ♂♂ i, EIB, Mar, 29·8, 29·5; ♀♀ a, PMB & EIB, Jan & Mar, 31·5, 33·5.

Furnarius rufus rufus: ♂♂ a, PMB & EIB, Jan & Mar, 57·5, 50·5; ♂♂ a, PA, Sep, 57·0, 59·0, 50·0; ♀ a, Isla Apipé Chica (Corrientes), Jan, 48·5.

Schoeniophylax phryganophila phryganophila: ♂♂ a, PA, Sep, 20·0, 22·5, 18·0; ♂♂ i, PA, Oct, 16·9, 19·5; ♀ i, La Paz (Entre Rios), Jan, 17·8.

Synallaxis ruficapilla: ♀♀ i, PMB, Jan, 15·8, 16·0, 14·4.

Synallaxis frontalis frontalis: ♂ a, PA, Sep, 13·0; ♀♀ a, PA, Sep & Oct, 15·0, 16·0; ♀ a, EIB, Mar, 16·3.

Certhiaxis cinnamomea russeola: ♂ a, PMB, Jan, 14·0; ♀ a, SC, Jan, 16·9.

Phacellodromus ruber: ♂♂ a, PMB, EIB & PA, Jan, Mar & Sep, 38·2, 36·5, 45·0; ♂♂ i, PMB, Jan, 34·9, 40·5; ♀♀ a, SC & EIB, 38·3, 35·8.

Anumbius annumbi: ♂ i, EIB, Mar, 27·0.

Thamnophilus gilvigaster gilvigaster: ♂ i, SC, Jan, 21·7.
Xolmis cinerea: ♂ i, EIB, Mar, 54·8; ♀♀ a, EIB, Mar, 61·8, 62·0.
Xolmis irupero: ♀ a, EIB, Mar, 29·5.
Arundinicola leucocephala: ♂♂ a, PMB, Jan, 13·8, 15·9.
Machetornis rixosa rixosa: ♀ a, EIB, Mar, 34·0.
Muscivora tyrannus tyrannus: ♀ a, PMB, Jan, 34·0.
Tyrannus melancholicus melancholicus: ♂ a, PMB, Jan, 43·4; ♀ a, EIB, Mar, 46·0.
Myiodynastes maculatus solitarius: ♂ i, PMB, Jan, 39·5.
Megarhynchus pitangua pitangua: ♂ i, PMB, Jan, 58·0; ♀ a, PMB, Jan, 60·5.
Pitangus sulfuratus bolivianus: ♂ a, PA, Oct, 75·0; ♀ a, EIB, Mar, 59·5.
Myiarchus tyrannulus tyrannulus: ♂♂ i, PMB, Jan, 28·0, 22·8, 30·0; ♂♂ i, EIB, Mar, 29·6 (fat), 23·8; ♀ i, PMB, Jan, 24·0.
Empidonax euleri euleri: ♂♂ a, PMB & EIB, Jan & Mar, 13·8, 12·3; ♀ i, PMB, Jan, 12·1.
Myiphobus fasciatus flammiceps: ♂♂ a, PA, Sep & Oct, 12·1, 15·3, 15·0, 15·0.
Hirundinea bellicosa bellicosa: ♂ a, PMB, Jan, 42·0; ♀ i, PMB, Jan, 39·5.
Pseudocolopteryx sclateri: ♂ a, PMB, Jan, 6·8.
Serpophaga subcristata: ♂ a, PMB, Jan, 8·6; ♂ i, EIB, Mar, 6·8.
Serpophaga munda munda: ♂ a, PA, Sep, 4·8; ♀♀ a, PA, Sep, 4·5, 7·0 (with egg).
Myiopagis viridicata viridicata: ♀ a, PMB, Jan, 11·8.
Campostoma obsoletum obsoletum: ♀ a, EIB, Mar, 7·9; ♀ i, PMB, Jan, 7·4.
Phytotoma rutila rutila: ♂ a, PA, Oct, 45·0.
Hirundo rustica erythrogaster: ♂ i, PMB, Jan, 18·8.
Cyanocorax chrysops chrysops: ♂ a, PMB, Jan, 160·0.
Troglodytes aedon musculus: ♂♂ i, EIB, Mar, 10·7, 11·0, 10·8; ♀ a, PMB, Jan, 12·1; ♀ i, PMB, Jan, 10·1.
Troglodytes aedon bonariae: ♂♂ a, PA, Apr, Sep & Oct, 9·5, 10·5, 13·0, 10·0, 10·5, 11·5; ♀ a, PA, Sep, 13·0 (with egg); ♀ i, PA, Apr, 12·0.
Turdus amaurochalinus: ♂ a, PA, Sep, 63·5; ♂♂ i, PA & EIB, Sep & Mar, 60·0, 57·0; ♀♀ a, PA, Sep & Oct, 67·0, 60·0, 70·0, 67·0, 70·0, 67·0.
Turdus rufiventris rufiventris: ♂♂ i, EIB, Mar, 64·0, 69·5, 65·5; ♀ i, PMB, Jan, 69·0; unsexed, PMB, Jan, 77·0.
Turdus leucomelas leucomelas: ♂ i, EIB, Mar, 75·0; ♀♀ a, EIB, Mar, 66·5, 74·5.
Cyclarhis gujanensis gujanensis: ♂♂ i, EIB, Mar, 27·5, 29·2; ♀♀ a, PMB & EIB, Jan & Mar, 28·0, 28·0, 28·8.
Vireo olivascens: ♂ a, PMB, Jan, 14·0.
Parula pitiayumi pitiayumi: ♀ i, EIB, Mar, 7·3.
Geothlypis aequinoctialis velata: ♂♂ i, PMB, Jan, 15·5, 11·5; ♂ i, PA, Sep, 12·8; ♀ a, PMB, Jan, 10·8.
Molothrus bonariensis bonariensis: ♂ a, EIB, Mar, 58·3.
Molothrus badius badius: ♂ a, PA, Sep, 50·0; ♀ a, PA, Oct, 43·5.
Icterus cayanensis pyrrhopterus: ♂ i, PMB, Jan, 28·5.
Agelaius cyanopus: ♀ a, PMB, Jan, 32·2.
Gnorimopsar chopi chopi: ♂ i, EIB, Mar, 61·0.
Tanagra cayana chloroptera: ♂ a, PMB, Jan, 19·8; ♀ a, PMB, Jan, 21·6.
Thraupis sayaca sayaca: ♂♂ i, EIB, Mar, 32·2, 32·5; ♀♀ a, EIB, Mar, 30·5, 33·9, 29·5; ♀ i, EIB, Mar, 33·0.
Thlypopsis sordida sordida: ♂♂ i, EIB, Mar, 16·3, 15·2; ♀♀ a, PMB & EIB, Jan & Mar, 17·8, 16·3; ♀ a, Paso Jupiter (Corrientes), Jan, 17·6.
Saltator caerulescens: ♀♀ a, PMB, Jan, 75·3, 62·5; unsexed, PMB, Jan, 56·0.
Paroaria capitata capitata: ♂♂ a, PMB, Jan, 22·0, 23·2; ♂ a, Bella Vista (Corrientes), Jan, 22·0; ♀♀ i, SC, Jan, 20·2, 20·2.
Cyanocompsa cyanea sterea: ♂♂ a, PMB, Jan, 22·3, 20·0; ♀ a, SC, Jan, 20·5.

Cyanocompsa cyanea argentina: ♀ a, PA, Sep, 21·3.

Sporophila collaris melanocephala: ♂ i, Bella Vista (Corrientes), Jan, 12·8.

Sporophila minuta hypoxantha: ♂ a, PMB, Jan, 8·9.

Spinus magellanicus ictericus: ♂ a, EIB, Mar, 11·0.

Coryphospingus cucullatus rubescens: ♂♂ a, PMB, Jan, 14·3, 14·4.

Arremon flavirostris polionotus: ♂ a, PMB, Jan, 30·3; ♂♂ a, EIB, Mar, 29·2, 28·0, 28·0; ♂ i, EIB, Mar, 28·2; ♀♀ a, PMB & EIB, Jan & Mar, 29·9, 27·9, 27·8.

Ammodramus humeralis: ♂♂ a, PMB, Jan, 14·3, 15·5; ♂ i, PMB, Jan, 15·2.

Zonotrichia capensis: ♂♂ a, PMB, Jan, 22·5, 22·5, 22·2; ♀ i, PMB, Jan, 19·5.

Poospiza nigrorufa nigrorufa: ♂ a, PA, Apr, 17·0; ♂♂ a, PA, Sep, 20·0, 20·7; ♀ a, PA, Sep, 20·0.

Poospiza melanoleuca: ♂♂ a, PA, Sep, 15·0, 15·0; ♀♀ a, PA, Sep, 14·0, 15·0.

Embernagra platensis platensis: ♂ a, PMB, Jan, 28·2; ♂ i, PMB, Jan, 27·5.

References:

Contreras, J. R. 1975. Caracteristicas ponderales de las aves del Parque Nacional Nahuel Huapi. *Physis* 34: 97–107.

Contreras, J. R. & Davies, Y. E. 1978. Aportes para el conocimiento del peso de las aves argentinas: I. *Hornero* (in press).

Fiora, A. 1933, 1934. El peso de las aves. *Hornero* 5: 174–188, 353–365.

Meyer de Schauensee, R. 1971. *A Guide to the Birds of South America.* Edinburgh & London: Oliver & Boyd.

Olrog, C. C. 1963. Lista y distribución de las aves argentinas. *Opera Lill.* 9: 1–377.

Short, L. L. 1975. A zoogeographic analysis of the South American Chaco avifauna. *Bull. Amer. Mus. Nat. Hist.* 154: 163–352.

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First records of *Sporophila caerulescens* from Colombia; a probable long distance migrant from southern South America

by J. V. Remsen, Jr. & Eugene S. Hunn

Received 18 July 1978

On 5 Aug 1974 Remsen saw 5 Double-collared Seedeaters *Sporophila caerulescens* in adult male plumage, and several associating females presumed to be this species, just south of the airport runway at Leticia, Amazonas, Colombia. The same group of birds was studied again the following day for 20 minutes from as close as 7 m. They were feeding at the tips of tall grass stems along a roadside. A single male was seen there again on 3 Nov 1974, although no birds had been seen in the interim. Specimens could not be obtained because the road bordered a Colombian military installation, but there was no doubt as to the identification. The Double-collared Seedeater is distinctly marked,

with a dark grey chin bordered by clean, white malars and a white throat, and a narrow, grey chest band, features unique within this genus. Remsen is familiar with the two dark-and-white seedeaters occuring at Leticia, *S. americana* and *S. lineola/bouvronides*.

On 7 and 11 Aug 1975 Hunn studied 1–2 males in weedy fields on the outskirts of Leticia. The distinctive throat and chest markings were seen clearly, as well as the overall grey upperparts, white underparts, and absence of a wing speculum. No territorial behaviour or singing was noted in any of the Leticia observations; the birds did not appear to be local residents and indeed could not be subsequently relocated.

Not only is *S. caerulescens* unkown previously from Colombia (Meyer de Schauensee 1964, 1970) but there are no previous records from north of the Amazon River. Its range is south of the Amazon in lower Amazonian, eastern, southern, and southwestern Brazil, eastern Peru, northern and eastern Bolivia, Uruguay, Paraguay, and south to central Argentina (Meyer de Schauensee 1966, Paynter 1970). The localities in eastern Peru are based on specimens thought to be migrants from the southeast (O'Neill 1969). The 6 specimens from Balta in southeastern Peru were collected between 25 Jun and 25 Jul. The 3 specimens from Yarinacocha, farther north in east-central Peru were obtained between 1 Aug and 5 Aug, virtually the same August dates as the Leticia observations. Yarinacocha, although 700 km southwest of Leticia, is still the closest known locality to Leticia for this seedeater.

S. caerulescens is primarily a stem-gleaner. It seldom feeds on the ground, concentrating on those seeds still born by the stalks. This is equally true for *S. lineola/bouvronides* and at least 6 other seedeaters (Schwartz 1975 and *in litt.*). When areas no longer produce appropriate seeds on the stalk, specialized stem-gleaning seedeaters such as *Sporophila* are obliged to look elsewhere for food, whereas other granivorous birds remain to feed on the reservoir of fallen seeds (P. Schwartz). This results in wandering to varying degrees and seasonality in the distribution of some species, as noted by Slud (1964) and Ridgely (1976) for *S. minuta* and *S. nigricollis* in Costa Rica and Panama respectively, and by P. Schwartz for these and all other seed eaters he knows in Venezuela. Remsen also noted pronounced changes in the numbers of *S. caerulescens* present at Tumi Chucua, near Riberalta, Beni, Bolivia: from 4 to 22 Nov 1976 (beginning of wet season), this species was seen daily in flocks of up to 200 in tall grass pasture borders, but it was completely absent during a second visit 29 Dec 1976–14 Jan 1977 (middle of wet season). In the intervening 5 weeks of daily field work in savannah 200 km south of Riberalta *S. caerulescens* was seen only once, a flock of 4 on 2 December.

Schwartz (1975) indicated that the northern South America populations of *S. lineola/bouvronides* are long distance migrants, not just off-season wanderers. Although Short (1975) considered *S. caerulescens* to be non-migratory, it seems probable that this species also makes long migrations, as thought by Hudson (1920) and O'Neill (1969), and suggested further by our Leticia observations, since Leticia is over 1100 km from northeastern Bolivia, the nearest breeding locality.

Movements of *S. caerulescens* and other *Sporophila* are undoubtedly tuned to wet and dry seasons and the effect of these on grass seed production. The dry season throughout the eastern Bolivia–Paraguay–northern Argentina–southern Brasil region is Jun–Sep, during which time *S. caerulescens* would

be most likely to be on the move, and it is these months which have produced the records for Peru and Colombia. The August Leticia records coincide with the local 'dry' season there, but rain still falls then almost every other day and grass seed production is virtually continuous. It seems likely that the presence of *S. caerulescens* at Tumi Chucua, Bolivia, was a reflection less of local conditions than of long established behaviour related to food availability in the breeding range farther south; those flocks could even have been transient from 'wintering' grounds further to the north where more continuous rain provided appropriate seeds.

Hudson (1920: 45) stated that *S. caerulescens* was one of the last to arrive at and first to depart from Buenos Ayres, where 'summer' lasts late Nov–Mar. Dr. Gloria de Villafane says that in northern Buenos Aires Province grasses and other appropriate plants begin to seed in November, reaching a peak sometime in January or February (per P. Schwartz). Thus it may be significant that the Tumi Chucua birds disappeared completely sometime between 22 Nov and 29 Dec. The single bird at Leticia in November may also have been returning to the south.

Much more data are needed, since not even the total breeding range of this species is known for certain. As emphasized by Schwartz (1975), gonad measurements and fat data are particularly important for determining migratory as opposed to breeding status. The degree of migratory behaviour in *Sporophila* will probably be a function of (a) seasonality of seed production on breeding ground, (b) degree of specialization on seeds born only on stalks, and (c) distance to nearest suitable feeding areas.

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References:

Hudson, W. H. 1920. *Birds of La Plata.* Vol. 1. New York: Dutton.
Meyer de Schauensee, R. 1964. *The Birds of Colombia.* Narberth, Pennsylvania: Livingston.
— 1966. *The Species of Birds of South America and their Distribution.* Narberth, Pennsylvania: Livingston.
— 1970. *A Guide to the Birds of South America.* Wynnewood, Pennsylvania: Livingston.
O'Neill, J. P. 1969. Distributional notes on the birds of Peru, including twelve species previously unreported from the Republic. *Occ. Pap. Mus. Zool. Louis. St. Univ.* 37: 1–11.
Paynter, R. A., Jr. 1970. Emberizinae. *In Check-list of Birds of the World.* Vol. 13. Cambridge Mass.: Museum of Comparative Zoology.
Ridgely, R. S. 1976. *A Guide to the Birds of Panama.* Princeton, New Jersey: Princeton Univ.
Schwartz, P. 1975. Solved and unsolved problems in the *Sporophila lineola/bouvronides* complex (Aves: Emberizidae). *Ann. Carneg. Mus.* 45: 277–285.
Short, L. L. 1975. A zoogeographic analysis of the South American Chaco avifauna. *Bull. Amer. Mus. Nat. Hist.* 154: 165–352.
Slud, P. 1964. The birds of Costa Rica. Distribution and ecology. *Bull. Amer. Mus. Nat. Hist.* 128: 1–430.

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An undescribed subspecies of Rudd's Apalis *Apalis ruddi* from southern Malawi

by D. B. Hanmer

Received 24 August 1978

Hitherto Rudd's Apalis *Apalis ruddi* has only been known in a peculiarly limited distribution in northern Zululand and southern Moçambique and in adjacent Swaziland (Hall & Moreau 1970: 181, Clancey 1966: 481, 1971: 50), with Vilanculos (21° 59′ S, 35° 19′ E) as the northernmost locality (Clancey 1971: 50, 162). Benson & Benson (1977) make no mention of it reaching southern Malawi, as a possibility even, though they suggest the possible occurrence there of 3 other species with an essentially lowland coastal distribution, viz. *Lamprotornis corruscus*, *Anthreptes reichenowi* and *Nectarinia veroxii*. (Examples of other lowland species which have already occurred are *Batis fratrum* and *Malaconotus viridis*.) It is therefore of outstanding interest to record the occurrence of *Apalis ruddi* at Nchalo, lower Shire Valley some 640 km almost due north of Vilanculos (see vegetation map in Wild & Fernandes 1967). The single specimen retained, of 3 recognised (see later), is considered sufficiently distinct to merit designation by name:—

Apalis ruddi caniviridis subsp. nov.

Description (colour references, Ridgway 1912): Nearest to *A. r. ruddi* Grant, but crown slightly more bluish, rest of upperparts more greyish, less yellow-green (Dull Citrine, pl. xvi, *v.* Citrine, pl. iv). Underparts no different. Upper surface of wings with ground greyer, less yellowish (citrine) green: likewise of tail, colder and greyer, less yellowish (citrine) green, but no appreciable difference in the yellow apical spotting. Iris noted at time of collecting as deep red (perhaps nearest Maroon or Claret Brown, pl. i), as against brown in *A. r. ruddi*. No apparent difference in size.

The name *caniviridis* (greyish green) is an allusion to the greyer green back and greyer tint to the ground of both wings and tail.

Distribution: Only known from Nchalo (16° 16′ S, 34° 55′ E), lower Shire Valley, Malawi, at 60 m above sea-level.

Type: Museum of Malawi No. MMB. 549, adult ♂, found recently dead by Mrs D. B. Hanmer on 21 December 1977.

Measurements and weight of Type: Wing (flattened) 48, tail 47·5, culmen from skull 15, tarsus 19·5 mm, weight 10·2 g.

Material examined: The type has been compared with 7 specimens of *A. r. ruddi* from the plains of Moçambique from the mouth of the Limpopo River northwards in Sul do Save and 3 of the very distinct *A. r. fumosa* Clancey (1966: 481) in the Durban Museum.

Other remarks: Two other individuals similar in plumage to the type of *A. r. caniviridis* have been netted at Nchalo since I started working there in 1973, but had to be released. Their particulars were as follows (external sexing seemingly impossible):— 2 Jan 1978, wing 49, tail 53 mm, weight 9·6 g; 3 Apr 1978, wing 50, tail 52 mm, weight 9·8 g. The January specimen had the iris light brown, not deep red, and was probably immature. A fourth bird with a red eye, was seen on 14 Jul 1978 in a guava tree in my garden.

The first bird was found dead on the edge of dense thicket (cf. Benson & Benson 1977: 22) after an insecticide spraying operation, while the other two birds were caught in, and released from, nets set up in the open, but with dense thicket only some 2 m distant on either side. This is almost certainly its true local habitat, in which it must be very sparse, and the reason why it has remained undiscovered since ornithological exploration started in the lower Shire Valley more than a century ago (Benson & Benson 1977: 220). Further south, the habitat of *A. r. ruddi* seems very similar, and it likewise is very sparse (Clancey 1971: 50). Possibly the 2 populations are by no means as widely sundered as might be supposed from present knowledge and in this respect the relatively small scale map of Wild & Fernandes (1967) may be misleading. However, P. A. Clancey suggests that the new race may be restricted to the relatively dry country of the southern Shire Valley and the adjacent Tete District of Moçambique, being more or less cut off from southern populations by the *Brachystegia* country of Manica and Sofala.

The sparseness of *A. ruddi* might be explained as unsuccessful competition with *A. flavida*, as suggested by Hall & Moreau (1970: 181), and since 48 *A. flavida* have been ringed at Nchalo since 1973, this may be the case. Also, the almost complete clearance of woodland and thicket in the lower Shire Valley outside protected areas may have caused a movement of thicket dwelling species into areas where they did not previously occur. Several have been caught recently at Nchalo, which almost certainly did not occur there previously:— e.g., *Turtur afer*, *T. tympanistria*, *Cercococcyx montanus*, *Apaloderma narina*, *Merops boehmi*, *Malaconotus viridis* and *Trochocercus cyanomelas*, although not all of them have remained there to breed.

Hall & Moreau suggest that *ruddi* has a hybrid derivation from *A. thoracica* and *A. flavida*, but C. W. Benson and M. P. Stuart Irwin agree that, on the basis of an examination of museum specimens, it is derived from *flavida*.

Acknowledgements: I wish to thank P. A. Clancey for his invaluable help in comparing the specimen of *A. r. caniviridis* with material of *A. r. ruddi* and *fumosa* and for his assistance with the description of the new race. I also wish to thank C. W. Benson and Dr. A. C. Kemp for helpful correspondence, while the former has assisted in the writing of this note. The work at Nchalo has been assisted by grants from the Frank M. Chapman Memorial fund, for which I am most grateful.

References:

Benson, C. W. & Benson, F. M. 1977. *The Birds of Malawi*. Limbe: D. W. K. Macpherson (Sponsor).

Clancey, P. A. 1966. A catalogue of birds of the South African sub-region. Part IV. *Durban Mus. Novit.* 7 (12).

— 1971. *A Handlist of the Birds of Southern Moçambique*. Lourenco Marques: Inst. Invest. Cient. Moc.

Hall, B. P. & Moreau, R. E. 1970. *An Atlas of Speciation in African Passerine Birds*. London: Brit. Mus. (Nat. Hist.).

Ridgway, R. 1912. *Color Standards and Color Nomenclature*. Washington, D.C.: A. Hoen.

Wild, H. & Fernandes, A. (eds.) 1967. *Vegetation Map of the Flora Zambesiaca Area*. Salisbury: Gov'ts of Portugal, Malawi, Zambia, Rhodesia and U.K.

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A population of *Anthus similis* on the Togo range in eastern Ghana

by I. R. Taylor & M. A. Macdonald

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During a visit to the area of Amedzofe (6° 52′ N, 0° 28′ E) in eastern Ghana in August 1976 we were told by Mr. G. Vanderstichelen about an unidentified pipit which had been seen regularly in the past on a nearby hilltop (known locally as Mt. Game, 760 m) by himself and Dr. L. G. Grimes. We located the birds and it soon became obvious that it was a bird unknown to either of us. We took a full description of the plumage, calls and behaviour on that occasion and supplemented this with notes made in June 1977 (when an unsuccessful attempt was made to secure a specimen) and June 1978. These, together with our knowledge in the field of all other pipits likely to be found in the area, led us to identify the birds as Long-billed Pipits *Anthus similis*, a species known elsewhere in West Africa only from isolated highland areas of Sierra Leone-Guinea-Liberia, Nigeria, Cameroun, Niger and Chad (Serle & Morel 1977).

Because of the interest attached to the discovery of what appears to be a separate population of this greatly fragmented species we provide here a full field description of the birds together with notes on their behaviour and habitat.

Description. A largish pipit, appearing slightly smaller than *A. novaeseelandiae* (not available for direct comparison) perhaps because of its more crouching stance. Crown mantle and rump brown with definite but poorly delineated darker centres to feathers. At a distance streaking above was not apparent and the upperparts appeared uniform earth brown. Forehead darker than nape. Supercilium white to off-white, line through eye black, short narrow malar stripe black. Bill dark, not exceptionally long, slender.

Throat whitish. Breast buff to greyish with distinct narrow streaks on lower throat and breast, the streaked area sharply divided from the plain lower-breast and belly. Lower-breast, belly and under-tail coverts were very variable between individuals, shading from pale buffish-white to deep rufous-buff.

Wings dark with pale margins to median and greater coverts, 'primaries and secondaries.

Tail moderately long, brown with off-white outer feathers more or less tinged with pale buff. The narrow pale fringe visible in flight suggested that the pale colour is confined to the outermost feathers with little or none on the second pair.

Legs moderate length, flesh colour.

Calls. A faint 'cheet cheet'; a very short soft metallic 'twink' given before and just after rising, and intermittently in flight; a drawn-out 'tsee' heard only in flight.

Song. A repeated 'tue-tseeu' or 'tue chwheeu', the second note being very harsh. Given while stationary on the ground, possibly while hovering. Heard in June 1977 and June 1978.

Behaviour. Usually seen on rocks and rocky bluffs, avoiding trees, but flushed frequently from grass, to which it probably walked from the rocks on which it landed. Two birds in August 1976 seen in small cassava farm on the edge of the grassland. Gait rather creeping, suggestive of *A. spinoletta*.

Numbers. On Mt. Game and 2 minor peaks below it we found evidence of only 4–5 pairs of pipits, a low population considering the area of apparently suitable habitat.

Habitat. The Togo Range is part of a chain of peaks 760–915 m high running from southeast Ghana to northern Benin (formerly Dahomey) where it becomes the Atakora Range. Amedzofe lies at the extreme southern end of this chain.

The summit on which the birds were found was bare of trees (a state which appears to be natural and not man-made) and covered with a variety of coarse tussocky grasses and dwarf herbs. The slopes were scattered with numerous emergent rocks and slabs. On two sides the peak was flanked by sheer rock faces, one a very high cliff, the other a low bluff 6–9 m high. The birds were frequently found on the smaller of the faces. The habitat seems typical of *A. similis* which is 'usually associated with highland grasslands and rocky slopes' (Hall & Moreau 1970). Similar grass-topped summits occur to the northeast of Amedzofe and it seems probable that the bird will be found on any peak in the range which combines open grassland with scattered rocky outcrops.

Acknowledgements: We are very grateful to Mr. G. Vanderstichelen for bringing this bird to our notice and for introducing us to Amedzofe.

References:

Hall, B. P. & Moreau, R. E. 1960. *An Atlas of Speciation in African Passerine Birds*. British Museum (Natural History): London.

Serle, W. & Morel, G. J. 1977. *A Field Guide to the Birds of West Africa*. Collins: London.

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Notes on the song, territorial behaviour and the display of the Antillean Crested Hummingbird *Orthorhyncus cristatus exilis* of St. Lucia, W.I.

by Karl-L. Schuchmann

Received 14 October 1978

During a research programme on the hummingbirds of St. Lucia, West Indies in December 1977 and August 1978, morphological and ethological data on the Antillean Crested Hummingbird *Orthorhyncus cristatus exilis* were collected in the southwestern part of the island, the Mt. Gimie area (Edmund Forest Reserve, elevation 1300 m). This sexually dimorphic species (Bond 1961) is the most common hummingbird on St. Lucia and is distributed virtually from sea level to montane rain-forest. It is the smallest

in weight and size of the 3 trochilids on this island. In montane habitats, where regularly all 3 hummingbird species overlap, *O. c. exilis* normally feeds on flowers close to the ground (e.g. *Lantana camara*), while the other two, the Green-throated Carib *Sericotes holosericeus* and the Purple-throated Carib *Eulampis jugularis*, frequently visit flowers from 2 to 3 m above the ground up to the tree tops (e.g. *Spathodea campanulata*).

The mensural and weight characteristics of *O. c. exilis* (Table 1) indicate that females differ significantly from males in wing-length ($p<0 \cdot 0025$; t-test) and tarsus ($p<0 \cdot 0005$; t-test).

TABLE 1

Mensural and weight characteristics of *Orthorhyncus cristatus exilis* of St. Lucia, West Indies.

	Sex	*Mean*	*SD*	*SE*	*Range*	*No.*
Wing (mm)	M	48·9	1·56	0·55	46·0–51·0	8
	F	46·3	0·30	0·58	46·0–46·7	5
Tail (mm)	M	28·9	1·25	0·44	27·0–31·0	8
	F	28·2	0·20	0·54	28·0–28·3	5
Bill (mm)	M	15·2	1·51	0·53	11·8–16·7	8
	F	15·9	0·40	0·18	11·5–16·2	5
Tarsus (mm)	M	3·8	0·30	0·46	3·0–4·0	8
	F	3·1	0·20	0·54	3·0–3·4	5
Weight (g)	M	3·1	0·25	0·09	2·8–3·4	8
	F	3·1	0·10	0·04	3·0–3·2	5

Only the males of *O. c. exilis* establish feeding territories. The females forage along fairly regular routes, 'traplining' many dispersed flowers (Colwell 1973, Feinsinger 1975). During the breeding season from January to August males hold display territories containing a feeding teiritory (core area) and an outer edge (buffer zone; see Pitelka 1951). The males advertise their presence in their territories by singing (see Fig. 1). Contrastingly, females establish only nesting territories, where they persistently attack intruders. I have never heard a female sing, but have occasionally noted a monosyllabic chase-call.

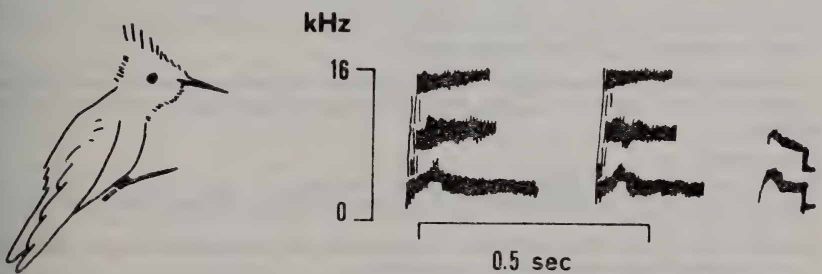

Fig. 1. Singing posture of ♂ *Orthorhyncus cristatus exilis* and sonogram of the song.

At the time of mating the female has already built her nest. Display and copulation take place in the male's territory. A female which enters a display territory is usually treated as a competitor for food and chased away immediately by the male. As soon as the female manages to perch in the

core area of the display territory the male's aggression is eliminated by species-specific behaviour, namely by the female perching motionless in front of him.

The observed display of the male can be divided into 3 different phases before the actual mating takes place (see Fig. 2):

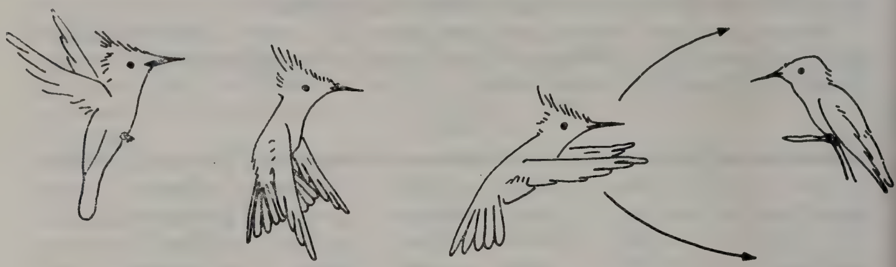

Fig. 2. Display phases of *Orthorhyncus cristatus exilis* (see text).

1) The male hovers with erected green iridescent crest in a vertical position in front of the female about half a metre distant.

2) The male flies in 'slow-motion' at a high wing-beat rate towards the female and abruptly claps the wings against the fanned retrices, producing a mechanical noise.

3) Immediately in front of the perching female the male, still with erected crest, starts flying to and fro at high speed in a semi-circle around the female. At the end of each semi-circle the male again produces a mechanical sound by beating the wings against its widely spread tail-feathers. During this flight pattern of the male, the colour of the iridescent green crest changes in relation to its angle to the female. The iridescence is optimally displayed when the male is exactly centrally in front of the female. The male repeats this flight 4–6 times. During the male's display the female is motionless except for slightly opening the beak in phase 3. Thereupon, the male copulates with the female.

A similar display has been observed with the Wire-crested Thorntail *Popelairia popelairii* (Schuchmann 1976).

Acknowledgement: The hummingbird research project was kindly supported by G. Charles, Dept. of Forests, Castries, St. Lucia, W.I. J. W. Glover gave the manuscript a critical reading.

References:

Bond, J. 1961. *Birds of the West Indies*. Collins: London.

Colwell, R. K. 1973. Competition and co-existence in a simple tropical community. *Amer. Nat.* 107: 737–760.

Feinsinger, P. 1975. On the relationship between wing disc loading and foraging strategy in hummingbirds. *Amer. Nat.* 109: 217–224.

Pitelka, F. A. 1951. Ecologic overlap and interspecific strife in breeding populations of Anna and Allen Hummingbirds. *Ecology* 32: 641–661.

Schuchmann, K.-L. 1976. Beitrag zur Biologie des Haubenfadenkolibris, *Popelairia popelairii*. *Z. Koln. Zoo* 19: 11–13.

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Sexual dimorphism in the Yellow-billed Shrike *Corvinella corvina* and in other African shrikes (subfamily Laniinae)

by L. G. Grimes

Received 11 November 1978

During cooperative breeding studies of the Yellow-billed Shrike *Corvinella corvina* in Ghana, adults and nestlings were colour ringed and a small collection of skins made (9 ♂, 6 ♀, 5 juv). Contrary to statements in some handbooks on African birds sexual dimorphism is possible through a patch of colour restricted in fullgrown shrikes to the mid section of the flank feathers; its development was followed through observations of ringed juveniles.

In females the colour pattern, beginning at the base of a typical flank feather (4–5 cm long), is dark slate grey for approximately the first cm of its length, Maroon (No. 31 in Smithe 1975) for the next cm and white for the remaining 2–3 cm. There is usually some faint grey barring near the tip, which is white in old females and tinged Cinnamon-Rufous (No. 40) in young females. The rachis is dark brown almost black and contrasts with the white of the outer half of the feather. This gives the flank a streaked appearance similar to the underparts of an adult shrike. In males the first cm of a flank feather is dark slate grey as in females, the next cm is between Cinnamon and Cinnamon-Rufous (Nos. 39 and 40). In older full grown males the terminal half of a flank feather is dark grey (in no way white) with some faint rufous barring near the tip. In relatively young males (at least 2 yr 5 m old) the cinnamon and cinnamon-rufous colour extends the whole way to the tip of the feather and usually there are one or more faint grey bars near the tip.

The maroon and cinnamon-rufous colour patches of the mid section of the flank feathers provide an unambiguous means of distinguishing the sexes of *C. corvina* in the field. Unfortunately these may be concealed for long periods and escape notice, but they are exposed to good effect when the shrikes are in group territorial disputes, in displays at a nest or when individual birds are preening. They are not normally visible in museum skins and this probably accounts for the lack of reference to them in most African handbooks. Swainson (1837) first drew attention to these feathers but incorrectly credited the dark maroon colour (i.e., 'very deep and pure chestnut') to the male. Neumann (1910) described their colours correctly as does Bates (1930). Bannerman (1939, 1953), however, and Serle, Morel & Hartwig (1977) make no mention of sexual differences. Mackworth-Praed & Grant (1960) describe the male as having a pale chestnut patch and simply state that it is absent in the female. The same authors (1973) mention the maroon patch (they describe it as chestnut) on the flanks of the female and add that it is usually paler in the male. This is incorrect in my experience and their statement suggests that some skins they examined had been incorrectly sexed.

During moult from the juvenile plumage, both sexes have the tips of their flank feathers faintly coloured cinnamon-rufous. This was first noted by Alexander (1902), but subsequently overlooked. It may be picked out in the

field by about the 7th week of life and may persist as late as the 20th week. Around about the 11th or 12th week the sexual dimorphic colours on the flank feathers are sufficiently developed to allow separation of the sexes in the field. Early in the study when these plumage changes were not known, females showing this surface patch of cinnamon-rufous were incorrectly sexed as males.

An examination of skins of African shrikes (subfamily Laniinae) at the British Museum (Natural History), Tring revealed that sexual dimorphism similar to that of the female *C. corvina* occurs in several species, but not all. In the female Magpie Shrike *C.* (*Urolestes*) *melanoleucus* the flank patch is white whereas in the male the flank feather is uniform black similar to feathers of the underparts. Females of *Lanius excubitorius*, *L. cabanisi*, *L. dorsalis*, *L. mackinnoni* and most races of *L. collaris* (see later) have a concealed maroon patch on their flanks as in *C. corvina*. The males, however, do not have the cinnamon-rufous patch of the male *C. corvina* and their flank feathers are slate grey at the base merging to white at the tips, as are the rest of the feathers of the underparts. In contrast no sexual dimorphism occurs in the flank feathers of *L. excubitor* and *L. somalicus* and these are similar to those found in the male *Lanius* species already listed. Interestingly, juvenile *L. cabanisi* have the cinnamon-rufous wash on the surface of their flank feathers, but it was not detectable on the skins examined of juvenile *L. excubitorius*. In addition, a a young female *L. cabanisi* had the characteristic maroon colour concealed underneath this surface colour, as is found in *C. corvina*.

In the African red-backed shrikes, the female of *L. souzae* has a tawny wash to the flanks which distinguishes it from the male, but this is not the same as the restricted patch of concealed colour on the flanks of the fiscal shrikes and *Corvinella* species. In the remaining *L. gubernator*, sexual dimorphism is evident on the upperparts, but the flank colours are similar in both sexes.

The phenomenon of a (concealed) maroon flank patch in females of 5 species of *Lanius* shrikes seems to be a peculiarity of sub-Saharan Africa. This had been previously realised by Jackson & Sclater (1938) and, as a result, in their treatment of the genus *Lanius* they used subgenera and accorded these 5 species together with *L. excubitor* and *L. somalicus* to a subgenus *Fiscus*. The Fiscal Shrike *L. collaris* is also unusual as 3 of its sub-species *L. c. newtoni* (found on Sao Thome), *L. c. capelli* (found in west Uganda, southern Zaire, Zambia, Malawi and most of Angola) and *L. c. Smithii* (Sierra Leone to central Camerouns and further eastwards) lack this female characteristic (White 1962, M. Macdonald and I. Galbraith *in. litt*).

The relationships between *Lanius* species is uncertain. Hall & Moreau (1970) suggest that *L. excubitor* and *L. somalicus* belong to the species group which includes *L. collaris*, *L. dorsalis* and *L. mackinnoni* and they include the Asian species *L. sphenocercus*, which also lacks the maroon flank patch in the female. At the same time they place *L. excubitorius* and *L. cabanisi* in a separate group, and these shrikes, unlike the Fiscal group, are gregarious throughout the year as are the *Corvinella* species.

Mayr & Short (1970: 71) have also examined relationships within the genus *Lanius* and proposed a superspecies comprising *L. excubitor*, *L. ludovicianus* (found in southern North America and which may prove to be

conspecific with *excubitor*) and possibly *L. sphenocercus*. They suggest in addition that *L. dorsalis*, *L. somalicus*, *L. excubitorius* (*excubitoroides*), *L. schach* (southeast Asia and New Guinea), *L. tephronotus* (northwest Himalayas) and *L. minor* at least should be treated with them as a species group.

If Hall & Moreau, and Mayr & Short are correct in their suggestions, then in Africa these female maroon flank patches have developed independently in two groups of *Lanius* species not immediately closely related (C. M. N. White *in. litt*), as well as in *C. corvina*.

Amadon (1966) has emphasised that sexual dimorphism in plumage, however slight, is to be assumed adaptive. Swainson (1837) assumed that the colour difference in the flanks of *C. corvina* would be shown to play an important part in their sexual behaviour. Duiing the 5 years of the cooperative breeding study, copulation was observed on 5 occasions only, and on none of these occasions were the flank colours prominently displayed. They are prominent during territorial disputes, but in what way they are significant in these displays is not known, and more study is required. As there are no closely related shrikes sympatric with *C. corvina* and *C. melanoleuca*, it is difficult to identify the selection pressures that would maintain the plumage dimorphism in these species. Presumably the same selection pressures apply to the other gregarious shrikes, *L. excubitorius* and *L. cabanisi*, which are also allopatric species. The presence of the distinctive patch in the females of *L. mackinnoni*, *L. dorsalis* and most races of *L. collaris* is again unusual. Current ideas on the development of sexual dimorphism (Thomson 1970) in sympatric species would lead one to expect the sex charactei to be present in the male rather than the female. A further complication is that the Afiican shrikes show only limited sympatry and the most interesting species to highlight this is *L. collaris*. The absence of the maroon patch in the insular *L. c. newtoni* is not unexpected. Nor is it too surprising in *L. c. capelli*, which is only sympatric with *mackinnoni* in two relatively small areas of its range (Hall & Moreau 1970). However, contrary to expectation, in South Africa *L. c. collaris*, the only *Lanius* present, has the maroon patch in the female.

Acknowledgements: I wish to acknowledge the helpful discussions with C. M. N. White during the preparation of this paper and to thank C. W. Benson for commenting on it. I also thank Mr. I. C. J. Galbraith for arranging for me a loan of *Lanius* skins.

References:

Alexander, B. 1902. On the birds of the Gold Coast Colony and its hinterland. *Ibis*, Ser. 8(2): 278–333, 355–377.

Amadon, D. 1966. Avian plumages and moults. *Condor* 68: 263–278.

Bannerman, D. A. 1939. *The Birds of Tropical West Africa*. Vol. 5. The Crown Agents for the Colonies: London.

— 1953. *The Birds of West and Tropical Africa*. Oliver & Boyd: Edinburgh.

Bates, G. L. 1930. *Handbook of the Birds of West Africa*. Bale & Danielsson: Edinburgh.

Hall, B. P. & Moreau, R. E. 1970. *An Atlas of Speciation in African Passerine Birds*. British Museum (Natural History): London.

Jackson, F. J. & Sclater, W. L. 1938. *The Birds of Kenya Colony and the Uganda Protectorate*. 3 Vols. Gurney and Jackson: London.

Mackworth-Praed, C. W. & Grant, C. H. B. 1960. *The Birds of Eastern and Northeastern Africa*. Vol. 2, 2nd edition, Longmans: London.

— 1973. *Birds of West, Central and Western Africa*. Vol. 2. Longmans: London.

Mayr, E. & Short, L. 1970. *Species taxa of North American birds*. Nuttall Ornith. Club. Cambridge, Mass.
Neumann, O. 1910. Die Geschlechtsklieder zweier afrikanischer Vogel. *Ornith. Monat.* 18: 95–96.
Serle, W., Morel, G. J. & Hartwig, W. 1977. *A Field Guide to the Birds of West Africa*. Collins: London.
Smithe, F. B. 1975. *Naturalist's Color Guide*. Am. Mus. Nat. Hist.: New York.
Swainson, W. 1837. *The Natural History of the Birds of Western Africa*. Vol. 1. Lizars, Highley & Currey: Edinburgh.
Thomson, A. L. 1970. *A New Dictionary of Birds*. Nelson: London.
White, C. M. N. 1962. *A Revised Check List of African Shrikes, etc.*, Gov. Printer: Lusaka.

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The Yellow-billed Shrike *Corvinella corvina:* an abnormal host of the Yellow-billed Cuckoo *Cuculus gularis*

by L. G. Grimes

Received 23 October 1978

The recorded number of host species parasitised by the Yellow-billed Cuckoo *Cuculus gularis* are few. Friedmann (1967) lists 10 possible species, but Payne & Payne (1967) and Jensen & Jensen (1969) reduce this to 6 (*Dicrurus adsimilis*, *Turdoides jardineii*, *T. libonyanus*, *Pycnonotus barbatus*, *Lanius collaris*, *Passer diffusus*) for which there is, in their opinion, unambiguous data that nest parasitism occurs. To this list can now be added the Yellow-billed Shrike *Corvinella corvina*, albeit an apparently abnormal host.

During a 5-year study of the cooperative breeding behaviour of this shrike at Legon, Ghana (5° 38′ N, 0° 11′ W) only one case of nest parasitism was discovered in over 160 shrike nests that were found. The nest belonged to a group of 9 shrikes, and the intention was to use it to study the feeding rates of nestlings and the individual contributions made by the shrikes, 6 of which were colour ringed. The nest was not, therefore, visited after the clutch size was known (5 eggs completed on 25 April) until the expected hatching dates (12/13 May). During 10 hours of observations on 15 May from a hide placed 20 m away from the nest there was no unusual behaviour to suggest that anything was amiss. The mean feeding rate of 5·1 feeds/hr was not unexpected for a nest that possibly contained a brood of 3 or 4 shrikes a few days old, and all members of the group participated in feeding. The next observations from the hide were on 23 May and 30 minutes elapsed before I realised that a well feathered *C. gularis* nestling was the sole occupier of the nest. My field description of the nestling agreed with that of Tarboton (1975), and the identification is certain in my mind. The cuckoos *Clamator levaillantii* and *Chrysococcyx caprius* also breed at Legon, but their nestlings cannot be confused with that of *C. gularis* (Jensen & Jensen 1969). Further periods were spent observing the cuckoo on 25 and 26 May. By this time the bird filled the nest, uttered calls quite unlike a shrike's of the same age, and crouched in the

nest quivering its wings when being fed rather than moving excitedly towards the incoming bird with the food, as do nestling shrikes. Although I never saw the cuckoo at close quarters, only observing it through binoculars (8 × 44), I am confident, judging from its behaviour on 26 May, that it did not starve to death in the nest. What eventually became of it is not known; it was not in the nest on 28 May, and it was never seen again. There is a possibility that it left the nest prematurely due to the hostility of the helper shrikes (see later). Unfortunately the incubation period of the cuckoo's egg is not known accurately enough (11–17 days—Tarboton 1975) to exclude the possibility that it was fully fledged when it left the nest (fledgling period 22 days—Tarboton 1975). Either way it is reasonable to conclude that it was abandoned after it left the nest, for on 28 May the shrikes continued to visit the nest and the female called from it; by 7 June the shrikes were visiting a new nest. As a young Yellow-billed Cuckoo is thought to be dependent on its foster parents long after it leaves the nest (Friedmann 1948: 59), it is assumed that it did not survive.

The behaviour of the group of shrikes at this nest, particularly that of the breeding female, was markedly different from that at a normal nest (Grimes in prep.). While incubating and brooding, most females call and beg in much the same manner as dependent fledglings, and in response other members of the group visit the nest and usually bring food. When the female is brooding, all food brought for the nestlings is first given to her, and she then feeds the young. The constancy of brooding (expressed as a percentage and defined as the proportion of the time spent brooding, or quasi-brooding in the case of the cuckoo) is normally initially the same as the constancy of incubation (Fig. 1) (Skutch 1976). The value of brooding for a nest with young shrikes becomes zero on about the 8th or 9th day, the young remaining in the nest for a further 10 days. In marked contrast to such normal behaviour, the female remained for long periods on the nest for the whole time the cuckoo was in it, and long after it was necessary to brood it. The time on the nest increased rather than decreased (Fig. 1), and throughout her extended stay on the nest the female persistently called and begged.

During 14 hours of observations on 23, 25 and 26 May, 136 visits to the nest were made by various members of the group. On 51 (37%) of these no food was brought. On 32 visits (23%) the food brought was not given to the cuckoo but either eaten by the shrike bringing it or by the brooding female. Of the 53 recorded feeds given to the cuckoo, 38 (72%) were via the breeding female. Marked hostility was shown by several helper shrikes towards the cuckoo while the breeding female was away from the nest; it was pecked and gripped about the bill and legs, and harsh alarm calls and threat displays were frequent. Such hostility, and inefficiency or reluctance by helpers in the group to feed young in the nest never occurred at nests with young shrikes. These observations suggest that the cuckoo would have had little food had it not been for the persistent begging and calling of the female shrike. Because of this and the marked difference between the behaviour of the helpers to the cuckoo and their behaviour to young of their own species, it seems reasonable to conclude that the nest parasitism was abnormal. Of the known hosts of the cuckoo, two (*Turdoides jardineii* and *Pycnonotus barbatus*) breed at Legon but their breeding has not been studied; other potential hosts at Legon are *T. plebejus* and *Passer griseus*.

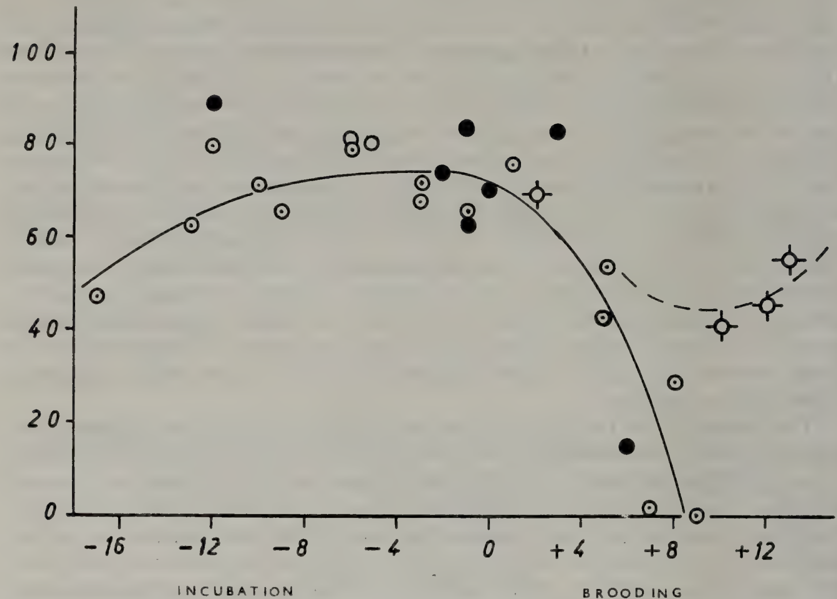

Fig. 1. The constancy of incubation and brooding recorded at three (○, ◎, ●) normal nests of *Corvinella corvina* and at one (+) nest parasitised by the cuckoo *Cuculus gularis*. The time is in days relative to the hatching (day zero) of the shrike's eggs.

Although what is known of the Yellow-billed Cuckoo does not suggest that there is marked development of host mimicry, and the cuckoo's egg was not seen, it is of interest that one of the known types of egg laid by the cuckoo (Pitman 1957, Tarboton 1975), described as being very pale pink with spots of mauve and russet, is not dissimilar to the egg of the shrike.

Acknowledgements: I am grateful to Mr. F. Walsh for drawing my attention to the interest of these observations and to Dr. R. B. Payne for commenting on the paper.

References:

Friedmann, H. 1948. *The Parasitic Cuckoos of Africa*. Washington: Academy of Sciences.
— 1967. Alloxenia in three sympatric African species of *Cuculus*. *Proc. U.S. National Mus.* 124: 1–14.
Jensen, R. A. C. & Jensen, M. K. 1969. On the breeding biology of southern African Cuckoos. *Ostrich* 40: 163–181.
Payne, R. B. & Payne, K. 1967. Cuckoo hosts in southern Africa. *Ostrich* 38: 135–143.
Pitman, C. R. S. 1957. On the eggs of the African cuckoo, *Cuculus canorus gularis* Stephens. *Bull. Brit. Orn. Cl.* 77: 138–139.
Skutch, A. F. 1976. *Parent Birds and their Young*. Austin & London: University of Texas Press.
Tarboton, W. 1975. African Cuckoo parasitising Forktailed Drongo. *Ostrich* 46: 186–188.

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IN BRIEF

Protection of *Geronticus eremita*

In response to my note (*Bull. Brit. Orn. Cl.* 97: 72) on the protection of the Bald Ibis *Geronticus eremita* I received information from 49 observers, mainly about the colonies in Morocco, for which I am very grateful. I shall be pleased to continue to receive any data of any sort.

The information shows a diminishing population. Around 1940 there might have been 500 pairs in Morocco. By 1966, of the 38 known breeding colonies, 19 had disappeared. There has been no further information about 6 other colonies since 1967. Cultivation of previously semi-arid feeding areas as well as an increasing disturbance at the breeding sites, seems to have been the cause. Of the remaining 13 colonies, 3 were deserted, but 3 new ones were discovered.

In 1975 I found 198 pairs breeding at 13 colonies, 5 of which (77 pairs) seem to have been unknown. There has been a dramatic decline from 121 pairs in 1975 to 42 pairs in 1978 according to the information sent to me, mainly caused by hunting and disturbance by tourists, as well as by the collection of eggs and young for the animal trade. Age determination of the Waldrapp (Hirsch (1976) *Orn. Beob.* 73: 225) to distinguish between possible breeding or non-breeding birds outside the colony is of help in observations sent to me.

About 70% of the Moroccan Waldrapp population is present throughout the year. As wintering places, there are probably only 3 preferred areas. For the protection of the breeding places an IUCN/WWF programme will try to establish nature reserves in typical coastal areas, the plains and the High Atlas.

12 August 1978 Udo Hirsch

Address: World Wildlife Fund, Conservation Department, CH 1110 Morges, Switzerland.

First record in the Seychelles of Northern Pintail *Anas acuta acuta*

On 18 Feb 1977 an adult pair of Northern Pintail *Anas acuta acuta* was observed at Mahé Island in the Seychelles. This is, according to Dr C. J. Feare, the first record of Pintail for the Seychelles. They were seen together on a rock in a marshy area, surrounded by mangrove, near Police Bay at the southern point of Mahé Is. Photographs were taken, one of which is to be deposited in the Museum of Zoology of Cambridge University. The winter distribution of Northern Pintail is given as 'south to North Africa, the Nile Valley, Abyssinia, Persian Gulf, India, Ceylon . . .' by P. Scott (1972), and Williams (1963) considers the Pintail to be a 'less common winter visitor to East Africa'.

Ducks are seen fairly frequently in the Seychelles during the northern winter, most of them *Anas querquedula*, but several much larger ducks have also been seen but not identified (C. J. Feare). Penny (1974) lists no ducks in the Seychelles but mentions the record of *Dendrocygna viduata* at Aldabra.

To me it seems most probable that the Pintails were brought the 2,000 km to the Seychelles from East Africa or Abyssinia by the northwest monsoon. There are no islands between the African mainland and the Seychelles except the Amirant Islands about 800 km southwest of the Seychelles.

I wish to thank Dr. C. J. Feare for his information on ducks in the Seychelles and his advice about publishing this record.

References:

Penny, M. 1974. *The Birds of the Seychelles and the Outlying Islands*. Collins: London.
Scott, P. 1972. *A Coloured Key to the Wildfowl of the World*. W. Royle: London.
Williams, J. G. 1963. *A Field Guide to the Birds of East and Central Africa*. Collins: London.

12 October 1978 N. T. Ebenhard

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Eggs from the Collections of E. L. Layard

In relation to Brooke's paper (1978, *Bull. Brit. Orn. Cl.* 98: 75–80) on nineteenth century seabird eggs in the South African Museum, it may be of interest to note that Layard appears to have been in the habit of conducting extensive exchanges of eggs with other collectors, and many of his are now in the British Museum (Natural History), and probably in other museums as well. In the process of recataloguing the BM(NH) collection, I have found a considerable number of Layard eggs from Ceylon, South Africa, Mauritius, Fiji, New Hebrides, New Caledonia and Tonga. Of these, approximately 106 clutches were received directly by this Museum from Layard—a collection from 'South Africa and the Southern Islands' which was received and registered in 1869. Other clutches of his have been received through the collections of Salvin, Tristram, Crowley, Henry Buckley, Rothschild, Gould and James Davidson. It is not at present possible to say how many eggs of Layard's are in this Museum's collection, as the work of recataloguing will take some years to complete.

16 November 1978 Michael Walters

Address: British Museum (Natural History), Tring, Herts.

BOOKS RECEIVED

Ralling, C. 1978. *The Voyage of Charles Darwin*. Pp. 183. Profusely illustrated in colour. British Broadcasting Corporation: London. £6.75.

An interesting selection of Darwin's autobiographical writings arranged in chronological order, mainly covering the voyage of the Beagle, but also about his education and the development of his scientific and maturing thoughts. The selection is by the producer of the successful BBC 2 television series. The coloured illustrations are of the highest standard.

Goodwin, 1978. *Birds of Man's World*. Pp. 183. Many photographs and line illustrations. Cornell University Press: Ithaca & London. £5.95.

A simple but informative and lucid discussion of the impact of Man on the environment of birds, on birds in towns, on birds fed by Man and on birds introduced. There is an interesting set of observations on bread in the diet of over 25 species discussed individually and a final sensitive glimpse into a 'Future imperfect'.

NOTICE TO CONTRIBUTORS

Papers, whether by Club Members or by non-members, should be sent to the Editor, Dr. J. F. Monk, The Glebe Cottage, Goring, Reading RG8 9AP, and are accepted on the understanding that they are offered solely for publication in the *Bulletin*. They should be typed on one side of the paper, with double-spacing and a wide margin, and submitted with *a duplicate copy on airmail paper*.

Scientific nomenclature and the style and lay-out of papers and of References should conform with usage in this or recent issues of the *Bulletin*, unless a departure is explained and justified. Photographic illustrations, although welcome, can only be accepted if the contributor is willing to pay for their reproduction.

An author wishing to introduce a new name or describe a new form should append *nom.*, *gen.*, *sp.* or *subsp. nov.*, as appropriate, and set out the supporting evidence under the headings "Description", "Distribution", "Type", "Measurements of Type" and "Material examined", plus any others needed.

A contributor is entitled to 16 free reprints of the pages of the *Bulletin* in which his contribution, if one page or more in length, appears. Additional reprints or reprints of contributions of less than one page may be ordered when the manuscript is submitted and will be charged for.

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Correspondence about Club meetings and other matters not mentioned above should go to the Hon. Secretary, R. E. F. Peal, c/o B.O.U., Zoological Society, Regent's Park, London NW1 4RY.

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Bulletin of the

British Ornithologists' Club

Edited by

Dr. J. F. MONK

Volume 99 No. 2

June 1979

FORTHCOMING MEETINGS

Tuesday 10 July 1979 at 6.30 p.m. for 7 p.m. at the Goat Tavern, 3 Stafford Street, London W.1, (between Old Bond Street and Albemarle Street, nearest Underground station—Green Park). Mr. W. G. Harvey on *Ornithology in Indonesia, including aspects of conservation.* Those wishing to attend should send a cheque for £3.15 a person together with their acceptance on the enclosed slip to the Hon. Secretary at 2 Chestnut Lane, Sevenoaks, Kent TN13 3AR to arrive not later than first post on Thursday, 5 July.

Tuesday 18 September 1979 at 6.30 p.m. for 7 p.m. at the Senior Common Room, South Side, Imperial College, Prince's Gardens, S.W.7. Mr. E. F. J. Garcia on *The birds of Gibraltar.* Those wishing to attend should send a cheque for £3.95 per person to the Hon. Secretary at 2 Chestnut Lane, Sevenoaks, Kent TN13 3AR to arrive not later than the first post on Thursday 13 September.

Tuesday 20 November 1979 at Imperial College, Mr. M. E. J. Gore on "Birds of The Gambia".

Corrigendum

C. F. Mann's address in the December *Bulletin* (98-4) should have been given as: 123 Hartswood Road, London W12 9NG, England.

Gifts or offers for sale of unwanted back numbers of the *Bulletin* are very welcome.

Bulletin of the
BRITISH ORNITHOLOGISTS' CLUB

Vol. 99 No. 2 Published: 20 June 1979

The seven hundred and eighteenth meeting of the Club was held in the Senior Common Room, South Side, Imperial College, London, S.W.7 on Tuesday, 6 March 1979 at 7 p.m.

Present (Members' names in capitals)—P. HOGG (Chairman), Miss I. P. BARCLAY-SMITH and 2 guests, Mr. and Mrs. C. W. BENSON, K. F. BETTON, Dr. G. BEVEN, Mrs. D. M. BRADLEY and 2 guests, J. P. C. BURGESS, D. R. CALDER, R. D. CHANCELLOR, S. J. W. Coles, R. A. N. CROUCHER, M. D. England, I. J. Ferguson-Lees, D. J. FISHER and 1 guest, Mr. and Mrs. A. GIBBS and 1 guest, B. GRAY and 1 guest, M. E. K. Gore, D. GRIFFIN, P. Hayman, A. J. HOLCOMBE, Mr and Mrs. F. J. Hulbert, C. F. MANN, Dr. J. F. MONK, R. E. F. PEAL, R. Porter, P. S. REDMAN, P. J. SELLAR, Prof. W. H. Thorpe, P. D. W. TIMMS, Mrs S. J. TYLER, Mr. and Mrs. A. VITTERY, C. E. WHEELER and 7 other guests. Total—23 Members and 27 guests.

The speaker was Mr. M. D. England, O.B.E., who addressed the Club on "The birds of the Seychelles group of islands". He illustrated his talk with fine colour photographs which he had taken of birds of the Seychelles, including the first photographs ever of the Seychelles Brush Warbler *Bebrornis seychellensis* and the Seychelles Magpie Robin *Copsychus seychellarum* at the nest.

* * *

The seven hundred and nineteenth meeting of the Club was held in the Senior Common Room, South Side, Imperial College, London, S.W.7 on Tuesday, 24 April 1979 at 7 p.m.

Present (Members' names in capitals)—P. HOGG (Chairman), Miss C. E. Appleby, Miss M. Barry, Dr. G. BEVEN, Mrs. D. M. BRADLEY, D. Bradley, J. P. C. BURGESS, S. J. W. Coles, R. A. N. CROUCHER, SIR HUGH ELLIOTT, A. GIBBS, B. GRAY, R. Gray, MISS C. E. GODMAN, D. GRIFFIN, Miss J. M. Hogg, Mrs. P. Hogg, Miss C. S. Lloyd, Rev. and Mrs. G. K. McCULLOCH, C. J. MEAD, Dr. and Mrs. J. F. MONK, R. Monk, Dr. D. B. Peakall, R. E. F. PEAL, T. Stowe, Prof. W. H. THORPE. Total—15 Members and 13 guests.

The speaker was Dr. David B. Peakall, whose subject was "Toxic chemicals and fish-eating birds in the Great Lakes". Severe reproductive failure was noted in several species of fish-eating birds in the Great Lakes of North America in the early 1970s. Egg exchange experiments showed that both direct embryotoxic effects and behavioural effects were involved. Detailed studies have been made to evaluate these two aspects and some of the results have been published in the *Journal of Wildlife Management.*

ANNUAL GENERAL MEETING

The eighty-seventh Annual General Meeting of the British Ornithologists' Club was held at Imperial College, London, S.W.7 on Tuesday, 15 May 1979 at 6 p.m. with Mr. P. Hogg in the chair. Eight members were present.

The Minutes of the eighty-sixth Annual General Meeting (*Bull. Brit. Orn. Cl.* 98: 33, 36 & 75) were approved and signed.

The Report of the Committee and Accounts for 1978 were presented. After a short discussion it was proposed by Mr. J. G. Parker and seconded by Mr. B. Gray that they be received and adopted and this was carried unanimously.

There being no nominations additional to those of the Committee, the following were declared elected:—

Hon. Treasurer: Mrs. D. M. Bradley (re-elected).

Hon. Secretary: Mr. R. E. F. Peal (re-elected).

Committee: Mr. R. D. Chancellor (*vice* Mr. C. E. Wheeler who retired by rotation). Mr. J. G. Parker (*vice* Mr. P. J. Oliver, who had resigned).

The Meeting closed at 6.20 p.m.

The *Laniarius* bushshrikes in Sierra Leone

by G. D. Field

Received 4 October 1978

The genus *Laniarius* of African bushshrikes (Malaconotinae) is a group of generally sedentary and skulking birds of heavy shrubbery, all advertising their presence throughout the year by their loud, whistled calls, generically similar but specifically distinct. The genus has speciated in 3 main directions: birds all black, birds black with red/yellow breasts, and birds with white breasts (the white usually suffused with a pinkish or buffish wash). A representative of this last group is found over most of the lusher vegetation belts (except high forest) of the Ethiopian region, with 4 main forms over which there is controversy whether they should be considered full species (e.g. Hall & Moreau 1970) or races of one widespread species (e.g. White 1962).

One distinctive form *L. turatii* (all black above, white, suffused pinkish buff below, differing from the neighbouring *L. aethiopicus major* which has white on the wings and a pinkish wash below) occupies the northwest corner of the group's distribution, in Guinea Bissau, Guinea, and western Sierra Leone. Writing of it Bannerman (1939) said "It is most important to discover whether their [*aethiopicus* and *turatii*] respective breeding ranges coincide or overlap". The purpose of this note is to plot the distribution of these and the other two *Laniarius* species (*L. barbarus* and *L. leucorhynchus*) which occur in Sierra Leone, to show that there is almost complete segregation and that where they do overlap each behaves as a good species.

The local race of *L. barbarus*, *L. b. helenae* (red breasted), is confined to the mangroves which clothe the tidal rivers and most of the coastline except for the southern strip, known from the northern border area south to Bonthe, hardly leaving the mangrove shelter even for the coastal thickets in the immediate vicinity. Though rarely seen, its clear double whistle is an easy indication of its abundance in this habitat.

L. leucorhynchus (all black) was collected in 1912 near Freetown and somewhere on the Little Scarcies river in the northwest (Bannerman 1939), but its range has contracted (possibly resulting from the increased cutting of the forest regrowth and the spread of savanna conditions) and today it occurs commonly only in thick, virtually impenetrable forest regrowth or 'bush' in the southeast, west to Pujehun and the neighbourhood of Bo and north to Kono district. Isolated populations still probably occur further west but it is certainly extremely uncommon and, for instance, on the Freetown Peninsula during 15 years I have recorded (heard and seen) a pair one season only and that in atypical habitat of secondary forest, higher, darker, and easier to walk through than any *Laniarius* territory known elsewhere in the forest zone of Sierra Leone. Again, far the best indication of presence is the call, most commonly a series of 6–7 "hoo"s, ringing, full-sounding and resonant, with grating answers or slower, more measured "hooo"s from the female.

L. turatii and *L. aethiopicus* divide the rest of the country between them, with altitude apparently the key to distribution here (though not elsewhere, *turatii* being found in the hills of Guinea and *aethiopicus* in lowland Ghana). Throughout the western lowlands, both in the moist wooded savanna of

the north and the forest regrowth of the south (but not in true forest), *turatii* occurs, a common and successful species, marginally overlapping with *leucorhynchus* both in terrain and habitat at Pujehun and north of Bo. On the higher ground of the eastern plateau, above 1000 ft. and including the plateaux of the true mountains at about 4000 ft, *aethiopicus* takes its place. Though found in the forest galleries on the mountains, it prefers more open country, and where geographically it overlaps with *leucorhynchus*, in Kono district, they are ecologically segregated, *aethiopicus* in savanna woodland, *leucorhynchus* in thick second growth.

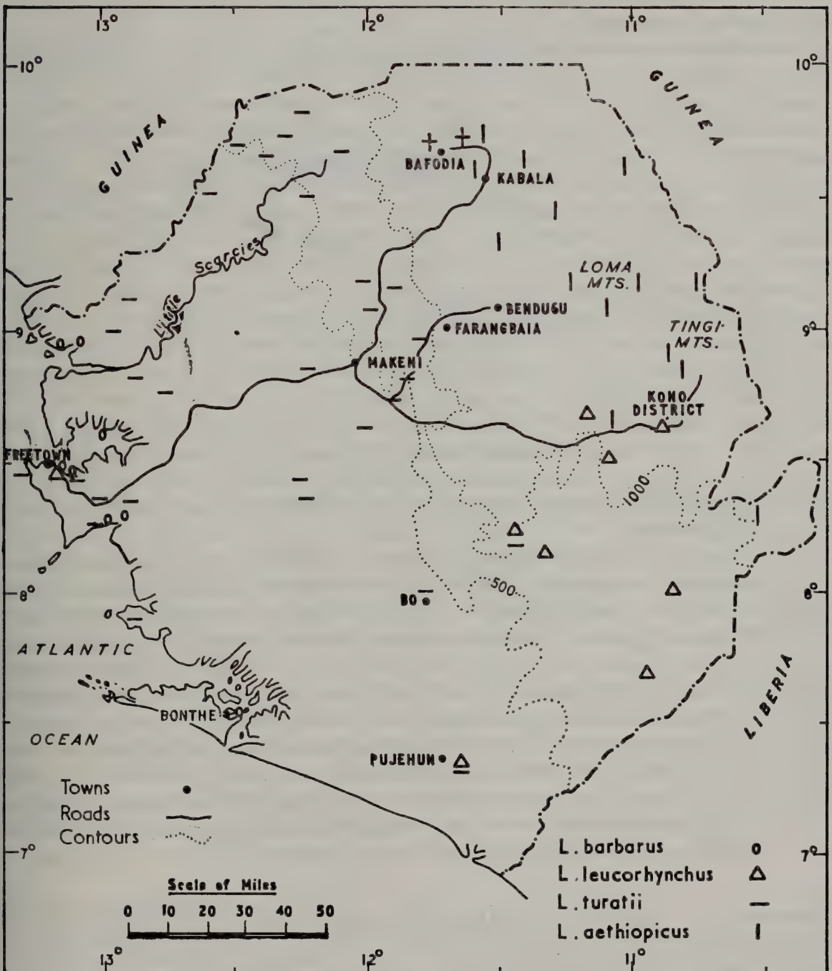


Fig. 1. Map of Sierra Leone, showing all places mentioned in the text, the approximate line of the abrupt escarpment between lowland and highland, and the distribution of *Laniarius* species as known at the present time. Pre-1940 records are not shown, as the vegetation has changed so greatly as to render these largely obsolete. (Drawn by Mr. A. J. Elba.)

The dividing line between *turatii* and *aethiopicus* cannot be fixed with complete accuracy, principally for geographical reasons, the abrupt escarpment from lowlands to highlands in central Sierra Leone not being easy to work and the extreme north, by the Guinea border, being ornithologically *terra incognita*. In the south of the range of *aethiopicus* there appears to be a genuine gap westwards where neither species occurs. I have worked the forest/savanna mosaic country round Farangbaia and Bendugu fairly thoroughly with negative results. Similarly, in the wooded savanna along the northern stretch of the main Makeni-Kabala road there is a gap of 40 miles where neither species is known, though not every point along the road has been covered.

From Kabala, where *aethiopicus* is relatively common, the road goes north for 11 miles and then branches west for 15 miles to its end at Bafodia, 1100 ft. *L. aethiopicus* occurs all along this road and round Bafodia itself, its most westerly known station. A few miles east of Bafodia *turatii* also appears and there is at least a 6–7 mile stretch of east–west overlap (how far the north–south overlap continues is unknown), with no indication of interbreeding or distinction of habitat. I have seen a pair of each species meet by chance in the same tree with no sign of mutual interest or aggression, the pairs continuing on their own foraging paths, and regularly one species occurs on ground where previously I have seen the other. Voice remains equally constant and specifically recognisable: *turatii* gives a long, metallic, single whistle "whooooo", which may be repeated several times and to which the female answers with a grating "k k k kkk"; *aethiopicus* has rather more variation but typically gives a much more liquid, slow 'hooo hooo hooo", sometimes lengthened to "hoo-oo hoo-oo", or a quicker and lighter "poo poo poo", the female answering with various "kk" noises, again more variable than the equivalent *turatii* sounds. Their habits (as with all *Laniarius*) are very similar, but *aethiopicus* is rather more likely to mount into trees and is thus easier to see.

Since there is no intergradation of forms, *L. aethiopicus* and *L. turatii* must have developed in isolation. The Bafodia area was until living memory well forested and there are still relict patches of forest and relict forest birds (e.g. *Eurystomus gularis*, *Ceratogymna elata*, *Ploceus tricolor*). Presumably the forest acted as a barrier separating the two. With its disappearance I suspect that *turatii* has pushed eastwards and, with the land rise here comparatively gentle compared with further south, has here, and here only, appeared above the 1000 ft contour. There is no indication as to which is the commoner species at Bafodia (my records suggest they are evenly blanced) but, just as in the south *turatii* seems to have taken advantage of the changing vegetation to push *leucorhynchus* eastwards during this century, so in the north it may possibly be in process of displacing *aethiopicus*.

References:
Bannerman, D. A. 1939. *The Birds of Tropical West Africa*. Vol. 5. Crown Agents: London.
Hall, B. P. & Moreau, R. E. 1970. *An Atlas of Speciation in African Passerine Birds*. British Museum (Natural History): London.
White, C. M. N. 1962. *A Revised Check List of African Shrikes* . . . etc. Gov. Printer: Lusaka.

Address: G. D. Field, Fourah Bay College, Freetown, Sierra Leone.

Nest description and plumage variation of the Sepia-brown Wren *Cinnycerthia peruana*

by Michael Gochfeld

Received 7 November 1978

Two little known wrens, the Sepia-brown Wren *Cinnycerthia peruana* and the Rufous Wren *C. unirufa* occur in sub-tropical and temperate Andean forests. On 23 September 1972, at the Carpish Pass, Department of Huanuco, Peru, Stuart Keith, Dan and Erica Tallman, and I, found a nest of *C. peruana* in very wet cloud forest at about 2700 m a.s.l. It was about 2.5 m above the ground, suspended from and partly penetrated by a curving bamboo stem.

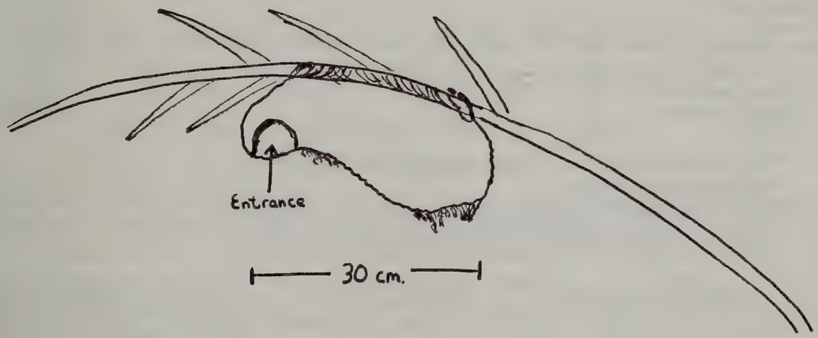


Fig. 1. Diagramatic drawing of nest of *Cinnycerthia peruana*.

The nest mass was firmly tethered to the support by fine rootlets. The overall size was 20 x 30 cm by 15 cm high. The main pouch containing the nest cavity was about 10 x 15 x 15 cm, consisting mainly of rootlets into which small strands of green moss were woven. The upper portion of this pouch was composed mainly of dried bamboo leaflets. The down-turned tunnel had a nearly circular entrance 3 cm in diameter, which was completely encircled by green moss.

The nest contained a 1 day old naked chick and a pipping egg. The egg's ground colour was pale creamy white and it was sparsely speckled with reddish brown, particularly toward the larger end. It measured 21.5 x 11.5 mm. Taczanowski (1887) describes a single egg found 26 August 1871 as white with few small reddish spots and measuring 21.3 x 11.8 mm. He does not mention the nest or young nor other habits. Schonwetter (1971) gives measurements of 18.0 x 13.0 (1.55 g) for egg(s) attributed to *C. unirufa*.

White head feathering

We captured and photographed an incubating bird, and this had white feathers encircling the eye and on the forecrown. Of the 7 Sepia-brown Wrens we saw in a group nearby, 3 had conspicuous white feathers on the head, including one with a white forecrown, chin and face. Although known to field ornithologists (e.g., J. P. O'Neill, pers. comm.) such individual variation with white facial feathering is not treated in the litereature. I

therefore examined specimens to ascertain the geographic distribution and possible age and sex factors influencing such variation. Of 17 specimens in the American Museum of Natural History (A.M.N.H.), 3 of 9 ♂♂ and none of 8 ♀♀ had white feathers on the head. This is not a significant difference (Fisher Exact Test, $p>.10$). One was a male from the Carpish Tunnel area, with white face and forehead.

TABLE 1

Occurrence of white facial feathering in the Sepia-brown Wren *Cinnycerthia peruana*.[1]

Location[2]	*Males*		*Females*		*Totals*		*Museum*
	White feathers present						
	No	Yes	No	Yes	No	Yes	
Carpish Pass	1	3	3	3	4	6	LSU
Carpish Pass	1	1	1	0	2	1	AMNH
Yuraccyacu	2	2	0	1	2	3	LSU
Lourde	5	0	3	0	8	0	LSU
Abra Patricia	6	0	2	0	8	0	LSU
Huaylas Pampa	1	2	4	3	5	5	LSU
Other localities	5	1	2	0	7	1	LSU
Other localities	5	2	7	0	12	2	AMNH
TOTAL	26	11	22	7	48	18	

[1]Only specimens of *C. p. peruana* are included in this table.
[2]See text for locations.

LSU = Louisiana State University, Baton Rouge, Louisiana.

AMNH = American Museum of Natural History, New York.

Through the courtesy of Dr. John P. O'Neill, I examined specimens in the Museum of Zoology, Louisiana State University (L.S.U.), Baton Rouge, Louisiana (Table 1). Ten specimens from the Carpish included 3 ♀♀ with white feathers (a single feather in one case and a completely white face in another). Five specimens taken at 2600 m a.s.l. near Yuraccyacu, Department of Ayacucho (13° 45′ S, 73° 47′ W) included a ♀ and 2 ♂♂ with some white feathers. Ten specimens from Huaylas Pampa (2950 m a.s.l.), Department of Loreto, included 3 ♀♀ and 2 ♂♂ with slight to extensive white feathering. An apparent family group (5 ♂♂ and 3 ♀♀) from San Jose de Lourde (2200 m a.s.l.), Department of Cajamarca, and 8 specimens from Abra Patricia (2050 m a.s.l.), Department of San Martin, had no white feathers.

Of the total of 65 L.S.U. and A.M.N.H. specimens of *C. p. peruana*, birds with some white feathers comprised 10 of 36 ♂♂ and 7 of 29 ♀♀, which shows no significant intersex difference (Chi Square Test, $p>.20$). There is as yet no evidence on whether white feathering might be age-related, though both immature and adult specimens in the collections show white feathers, and the white-faced bird we captured was presumably an incubating adult (though it could have been a sub-adult helper).

Meyer de Schauensee (1970) mentions that one race of *peruana*, the Bolivian bird *C. p. fulva*, has a broad buffy-white eyebrow, while another, *C. p. olivascens*, from Colombia and Ecuador, often has a buffy white patch on the forecrown. I interpret the former as a subspecific character and the latter has an intra-racial variation. The intra-population variation which we found at the Carpish occurs at several localities in Peru. Another wren, *Campylorhynchus turdinus*, has some races with white heads (*albobrunneus*, *harterti*) in Colombia and Panama, thus showing extreme geographic (=racial) variation.

However, the irregular, intra-population variation in white facial feathering, which occurs in the Sepia-brown Wren, is a unique phenomenon in the Troglodytidae, and clearly deserves attention.

References:
Meyer de Shauensee, R. 1970. *A Guide to the Birds of South America*. Livingston Publishing Co: Wynnewood, Pa.
Schonwetter, M. 1971. *Handbuch der Ooloqie*. Part 19.
Taczanowski, L. 1884. *Ornithologie du Perou*. Rennes, Vol. 2.

Address: Dr. M. Gochfeld, Department of Ornithology, American Museum of Natural History, New York, NY 10024, U.S.A. *Present address:* 133 Meadowbrook Drive, Princeton, NJ 08540, U.S.A.

On the possible existence of the New Caledonian Wood Rail *Tricholimnas lafresnayanus*

by Tony Stokes

Received 9 December 1978

The New Caledonian Wood Rail *Tricholimnas lafresnayanus* was described in 1860 and is now known only from 13 museum specimens (Fullagar, Disney & de Naurois in prep.). The most recent of these date from 1890 and all seem to have been secured by local villagers in the south of the island. The only record of its habits are observations made of captive birds in the early 1880's (Layard & Layard 1882).

It seems however that the species may still exist in very small numbers since unauthenticated accounts of captures by local villagers have continued to trickle to the ears of naturalists over the past 80 years (e.g. Warner 1947, de Naurois pers. comm.).

According to most authors, the rail is a close relative and congener of the Lord Howe Island Woodhen *T. sylvestris,* which is now reduced to a seemingly stable wild population of some 20 individuals atop a rugged peak on Lord Howe Island. Though uncertain, Disney (1974a) surmises that the feral populations of goats *Capra hirtus,* pigs *Sus scrofa*, rats *Rattus rattus* and cats *Felis domesticus* have contributed to the disappearance of *T. sylvestris* from the lowlands. The pig is the only one which does not at present share the surviving woodhen's habitat since it has apparently been unable to scale the peak.

In November 1975, I spent 2 weeks observing the Lord Howe Island Woodhen atop Mount Gower and discussing its biology with H. J. de S. Disney and Dr Peter Fullagar. I subsequently visited New Caledonia from 24 November–24 December 1976 to investigate recent reports of the existence of *lafresnayanus* and to conduct a search on the premise that the species' ecology would resemble that of *sylvestris*.

Though Olson (1973) believes that *sylvestris* and *lafresnayanus* should be separated generically, Ripley (1977) submerges them into *Rallus* with the comment that they are alike in many respects and may be considered part of a superspecies. Greenway (1967) also thought them very similar and Fullagar, Disney & de Naurois (in prep.) have retained both in *Tricholimnas*. Whatever

their taxonomy it is not unreasonable to assume they are ecological counterparts. Both are general olive-brown, flightless rails with narrow slightly down-curved bills, but *lafresnayanus* has a slightly longer bill and is a little larger than *sylvestris*, though their diet and foraging behaviour appear similar. Disney (1974b) states that *sylvestris* forage 'by scratching among the ground litter, and moving vegetation aside, with their bills; they do not use their feet'. They appear to feed on almost any invertebrate as well as the eggs and chicks of nesting Providence Petrels *Pterodroma solandri* (Fullagar & Disney 1975, Ripley 1977). Warner (1947) speculates that *lafresnayanus* eats snails, worms and foods similar to the Kagu *Rhynochetos jubatus*. In captivity the Layards (1882) fed it on '*Bulimi*, raw meat, and garbage', items which seem little different from the scraps readily taken by *sylvestris* round Disney's (1974b) camp.

One wonders on what evidence the Layards found *lafresnayanus* to be nocturnal. Perhaps if their birds were only active at night it was an artefact of captivity. Though *sylvestris* is definitely diurnal, its peak activity times are the crepuscular hours (pers. obs.) and both Disney (1976) and myself had difficulty in locating a *sylvestris* roosting site in the dense vegetation. Disney (1976) also reports that the species moves about at night on some occasions.

T. lafresnayanus probably lives in similar forest types to *sylvestris*. By deduction, if litter invertebrates are a major dietary component in the food of *lafresnayanus*, as they appear to be for *sylvestris* (pers. obs., Disney 1974b, Fullagar & Disney 1975), then areas with a fast accumulation and breakdown of detritus would probably be favoured because they contain more food. Soil fauna, indeed, may be of such importance to *sylvestris* that its reduction, as a consequence of a reduction in leaf litter by feral animals, could account for the disappearance of the bird from all lowland areas in Lord Howe Island (Disney 1974b).

Though goats are absent from New Caledonia its population of feral animals is worse than Lord Howe Island and some species such as pigs, cats, rats and Samba Deer *Cervus timoriensis* are very common. There are also reports of feral dogs *Canis familiaris*, cattle *Bos taurus* and horses *Equus cabellus*; however, these would exist only in small numbers and, as in the New Hebrides (Medway & Marshall 1975), it would be extremely difficult to establish the extent to which they are genuinely self-sustaining. In any case cattle and horses would have little effect on *lafresnayanus* in their present numbers. Of more concern is the fact that no part of the island is inaccessible to pigs (pers. obs., Rossart, Tonnelier, Begaud, pers. comm.). Overall there is little accurate knowledge of the distribution pattern and ecology of exotic animals and no research has been conducted or is envisaged (Rancurel, pers. comm.).

The Layards state that from native reports *lafresnayanus* 'appears to inhabit much the same localities as the "Kagou" '. In the same paper they say that the Kagu's habitat is precipitous ravines in the mountains. My melanesian guide pointed to such a ravine while we were camped on the remote headwaters of the Ouinne River and said he had heard the Kagu calling there in the early morning. Delacour (1966) says that the Kagu inhabits humid rainforest and now, presumably, any remnant *lafresnayanus* would also be restricted to that habitat. Three recent reports support this view.

There have been 3 post-1945 reports of the existence of *lafresnayanus*.

1. *The Warner Report*

In 1947 Warner reported that:
'Several Frenchmen who had lived for more than sixty years in the vicinity of Mount Mou assured me that the rail is still present in the in accessible glens of the mountain forests on the backside of Mount Mou and beyond it in the interior Mount Humboldt region. They called it the "Cocque de Bruyere" and described it accurately. A local resident informed Macmillan that he had captured one with the aid of a dog on Mount Panie only three weeks before. I received several such reports from various parts of the island including Bourail, La Foa, Canala and the priests and natives at the St. Louis Mission. Some were vague; but others gave such vivid descriptions of the bird and the capture that I was forced to believe a few birds were still alive.'

A local ornithologist (Th. Tonnelier, pers. comm.) comments that this report is very misleading because the reference to the vernacular name is misspelt and the people who used it may have been referring to the New Caledonian Grassbird *Megalurulus mariei*. The correct spelling is 'Coq de Bruyere' which translates as 'Cock of the heather'. This vocal and common bird is more likely to be seen in heather-type country than *lafresnayanus* but though the colouration is similar it is a much smaller bird and flies readily.

When I interviewed some old men of Col de la Piroque, at the foot of Mount Mou, and showed them a photograph of the coloured painting in Brenchley's (1873) book they said they knew of the wood rail but had not seen it on Mount Mou for more than 60 years and the dogs had probably exterminated it. If these are accurate reflections then the last sightings on Mount Mou would have been at the turn of the century. No thick forest now exists on or near the mountain as a suitable refuge for *lafresnayanus*.

2. *The Henwood Report*

In the north of the island the rail is known to Jack Henwood and his son, fishermen of Tao, a tiny village at the foot of Mount Panie. Mr Henwood was a collector for L. Macmillan, an assiduous biologist from the American Museum of Natural History, who lived in Tao for a month in 1936. Unfortunately his notes were not published though they have been referred to extensively by later authors (e.g. Warner 1947, Delacour 1966, Vuilleumier & Gochfeld 1976).

Mr Henwood (pers. comm.) has not heard of *lafresnayanus* in the region for many years. However his son told me that he had caught one on the southern ridge of the Ouieme River near its mouth about 15 years previously, that is 1961. The river drains the western slopes of Mount Panie–Mount Colnett and he marked the spot on a 1/50,000 map (Fig. 1). He recognised the bird from Sandford's drawing in Delacour (1966).

3. *The Rossart Report*

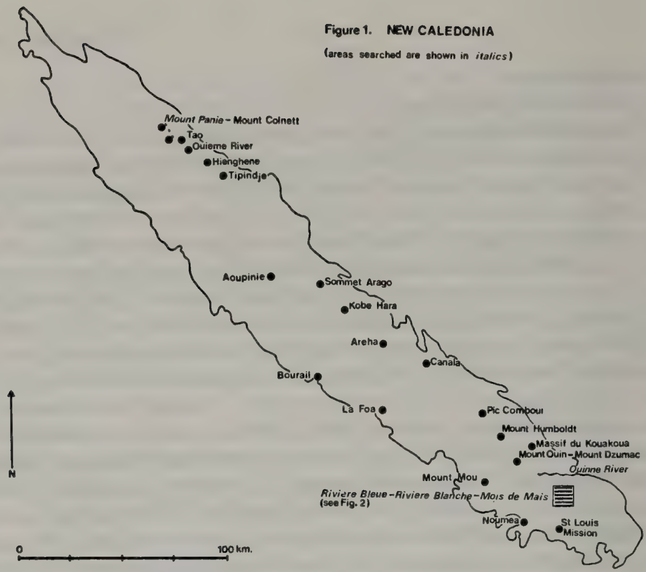
Professor R. de Naurois in 1971 (pers. comm.) located a Mr Rossart who made a 'very precise' report to him that: '*T. lafresnayanus* had been killed six years before, north of Mount Panie near the edge of the dense forest'.

Ripley (1977) also quotes de Naurois in giving the species status as 'very rare' and, incidentally, misquotes Delacour (1966) in listing an observation of the bird as 1956 instead of 1936.

On 26 November 1976 I spoke with Mr Rossart through an interpreter for 45 minutes and he marked a spot on a 1/200,000 map of the island where he

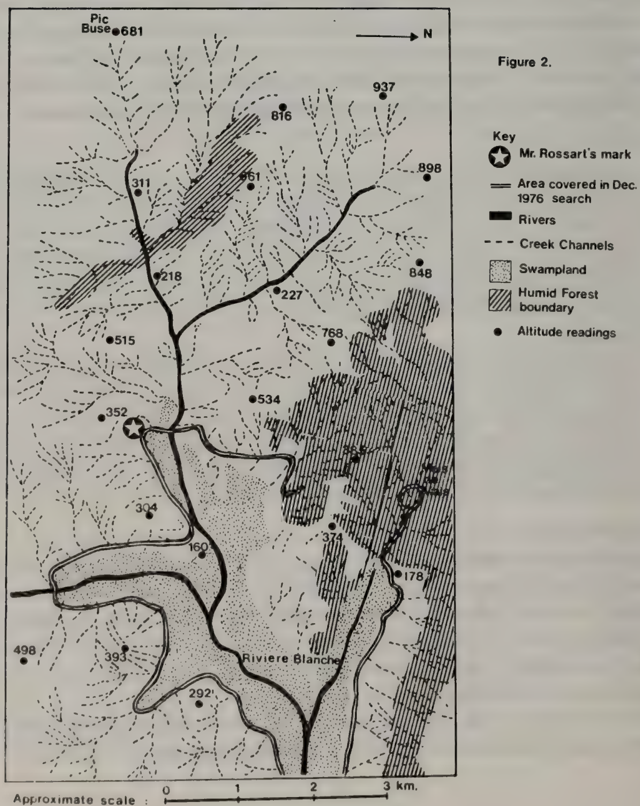
Figure 1. NEW CALEDONIA

(areas searched are shown in *italics*)



THE ROSSART REPORT

Figure 2.



said the natives who procured it had brought it to him. A surveyor by profession he has an extensive knowledge of the island's interior and his mark is on the southern ridge of the headwaters of the Riviere Blanche valley in the south of the island (Figs. 1 and 2). The reason for the wide discrepancy between this locality and that of de Naurois' account is not known.

According to Rossart the natives had caught the bird with a dog and brought it to him alive in June or July 1966. Since he had not seen one before he took some interest in it and later it was eaten by natives. He had recently been unable to find the natives soncerned since they had moved from their village.

In a comparison of Sandford's drawing, in Delacour (1966), and Benchley's (1873) painting he preferred the former saying that the bird was more reddish-brown on the breast not blue-grey, as in the painting, and the breast was also 'more hairy' than the painting. Certainly the Sandford drawing resembles the posture of *sylvestris* more than the painting does. Disney has examined all but two of the known specimens of *lafresnayanus* and comments (pers. comm.) that 'Mr Rossart is probably right on the description of the bird as I consider the photo of the coloured plate (Brenchley) is that of an adult bird and few adult birds have been collected. I think feathering in the young birds is more "loose" and "hair like" '.

My search for *lafresnayanus* was confined to areas of thick humid rainforest and rugged topography similar to where the relict *sylvestris* population survives. I also used information from the 3 most recent reports of *lafresnayanus* and mapped suitable habitat from an aerial reconnaisance of the island. Unfortunately only one area in the north and 2 in the south of the island were visited (Fig. 1). However other possibly suitable areas are listed in Table 1 and shown in Figure 1.

TABLE 1

Some areas possibly containing remnant *T. lafresnayanus* on New Caledonia.
(Areas 1–3 were visited in 1976)

1. Western slopes and ridges of Mount Panie-Mount Colnett and the Ouieme River.
2. Ouinne River headwaters.
3. Riviere Bleue, Riviere Blanche and Mois de Mai region.
4. Behind Tipindje in the Forêt de Neaba between Pouailatimbe (les Levres) and Mount Cantaloupa – perhaps the western faces of Pouailatimbe and Tonine.
5. The eastern face of Sommet Arago.
6. The western slopes of Kobe Hara falling into the Riviere de Nou.
7. The southwestern face of Areha falling into the Kouaoua tributary.
8. The slopes surrounding Aoupinie.
9. The wide area covering the slopes of Mount Humboldt, Pic Comboui and Massif du Kouakoue, especially precipitous areas.

Ground searches were made in the morning and evening hours at each locality. During searches an assortment of the shrill *sylvestris* calls were played at irregular intervals through a portable Sanyo cassette player, model M.2541, at maximum amplification. In the thick forest it is doubtful if these carried more than 25 m. In case they repelled rather than attracted *lafresnayanus*, occasional silent traverses were also made.

RESULTS OF EXPLORATION

No evidence of the wood rail was found during the searches and no unidentified calls, similar to *sylvestris*, were heard. Nevertheless the following notes from each of the 3 search areas may assist future visitors.

Mount Panie-Mount Colnett

The slopes of the 1961 Henwood sighting can be seen from the punt crossing the mouth of the Ouieme River. Though I was not able to search them they should be readily accessible to a thorough search for, though they range from very steep to precipitous, the humid forest occurs only in small stream valleys and does not cover a wide area.

The eastern slopes of Mount Panie are steep enough to make extensive coverage of them very difficult and tiring. More importantly much of the vegetation consists of very thick windswept scrub with stems growing so close together as probably to inhibit wood rail foraging. Certainly it is much thicker than that in which the Lord Howe Island bird now lives or, presumably, used to live. The humid forest on the mountains appear thicker and more extensive on the sheltered western slopes than the eastern slopes which abut the ocean. On the eastern side this forest has a lower canopy and grows only in sheltered pockets.

Our 4 day search revealed very fresh pig rootings over a wide area of the summit and extending into the valleys – even over the precipitous headwaters of the Oua Pandieme on the eastern slope. This area harboured a greater density of wild pigs than the other 2 visited. There were also many recent deer prints and rat and cat faeces on the summit. I received reports that the deer live only in the Niaouli *Melaleuca leucodendron* savannah forest but I also saw them in humid forest both on Mount Panie and near the Riviere Bleue in the south. This may have a wider implication for the survival of *lafresnayanus* if another report is correct: that wild dogs only follow the deer.

Ouinne River—Mount Ouin

The lower altitudes of this long river valley leading from Mount Ouin are clothed in humid forest only along the tributaries of the main river. These forests coalesce on the higher slopes. The lower ridges and slopes have a vegetation complex called 'le maquis des terrains miniers' (Le Borgne 1964) or 'the mining land bush'. It has an arid red lateritic soil prone to much water erosion due to sparse ground cover, low stunted bushes shrubs and ferns, and no herbs.

There were signs of pigs along the 3 tributary systems searched and my guide told me he had shot pigs there. Cat faeces were common and two rats were taken each night from 10 traps. There were no signs of deer although my guide had hunted them with success in the valley before. The shrill calls of the mountain graybird *Coracina analis* were at first thought to be *lafresnayanus* and it took a day of careful observation to prove that this was not so. It is unlikely that the wood rail could survive in the area.

Riviere Bleue, Riviere Blanche, Mois de Mai

The streams of these 3 adjoining localities all drain into Yate Lake in the southeast of the island. To the north, over a 1200 m range, is the Ouinne River.

The site of the Rossart report (Fig. 2) is in the middle of sparse 'mining land terrain' so the bird was probably captured elsewhere and brought to Rossart. Only 2 reasonably large areas of humid forest exist in the valley as likely wood rail habitat; both are on the northern slopes and the nearest is a 3–4 hour walk from Rossart's mark. The forest there is contiguous with the Mois de

Mai and only a very cursory one day search was feasible. The vegetation appeared sufficiently open and the litter deep enough to permit the bird to live, at least along the stream edges. Though there were abundant pig signs it still may warrant a thorough search, especially on the more precipitous ridges leading up the eastern face of the 768 m high mountain. The second area is further west than the first and could not be seen from Rossart's mark.

The riverine forest on the Mois de Mai and the Riviere Bleue, northeast of Rossart's mark, is very thick and difficult to penetrate. It may thin out at higher altitudes but it is doubtful that the rail would live on the lower slopes.

Though all sections of the area had abundant deer, pig, rat and cat signs few of the hunters who frequent the Coulee, Thi and Lembi river systems on weekends intrude into the reserves along the Rivieres Blanche and Bleue.

DISCUSSION

New Caledonia is economically dependent on nickel mining and an exploitative mining policy has allowed 4-wheel drive access to most rugged areas. Besides creating erosion, the roads allow hunters into the interior and hunting is a passion on the island (pers. obs., Warner 1947). It is also probably more intense in the south where the most promising areas for the wood rail remain and where all extant specimens seem to have been taken (Disney, Fullagar, pers. comm.). Little notice is taken of the game laws and their enforcement is almost non-existent outside reserves.

If *lafresnayanus* is an ecological counterpart of *sylvestris*, then probably a reduction in the feral populations of pig and deer would benefit the New Caledonian bird. Since hunting dogs are responsible for the capture of the rare wood rail reported, another measure for their survival would be the widespread adoption of muzzles for the dogs.

As it is, both Warner (1947) and Ripley (1977) believe the bird is not extinct but 'very rare' and the post-1945 reports support this view. Though the uncompromising New Caledonian terrain may have been the species greatest ally in survival, under the present conditions it is almost certain that any remaining birds will disappear. Therefore a captive breeding programme should be attempted with any future live specimens.

In addition, any future search would benefit from a long publicity campaign to attract recent reports from villagers. This could quickly and effectively survey the island and has proved successful in finding rare species in the past (Chisholm 1922).

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References:

Brenchley, J. L. 1873. *Jottings during the Cruise of H.M.S. Curacao among the South Sea Islands in 1865*. London: G. R. Gray.

Chisholm, A. H. 1922. The 'lost' Paradise Parrot. *Emu* 22: 4–17.

Delacour, J. 1966. *Guide des Oiseaux de la Nouvelle-Caledonie*. Paris: Delaccha and Niestle.

Disney, H. J. de S. 1974a. Woodhen. *Aust. Nat. Hist.* 18: 70–73.
— 1974b. Survey of the Woodhen. *in* 'Environmental Survey of Lord Howe Island'. Sydney: Lord Howe Island Board.
— 1976. Report on the Woodhen of Lord Howe Island. Unpub.ms. Canberra: Australian National Parks and Wildlife Service.
Fullagar, P. J. & Disney, H. J. de S. 1975. The Birds of Lord Howe Island: a Report on the Rare and Endangered Species. *I.C.B.P. Bulletin* XII: 187–202.
Greenway, J. C. 1967. *Extinct and Vanishing Birds of the World.* New York: Dover.
Layard, E. L. & Layard, E. L. C. 1882. Notes on the avifauna of New Caledonia, a catologue of the birds of the island with remarks by the Rev. Canon Tristram. *Ibis* (4)6: 493–546.
Le Borgne, J. 1964. *Geographie de la Nouvelle-Caledonie et Des Iles Loyaute.* New Caledonia: Ministere de L'Education de la Jeunesse et Des Sports.
Medway, Lord & Marshall, A. G. 1975. Terrestrial vertebrates of the New Hebrides: Origin and distribution. *Phil. Trans. Roy. Soc. Lond.* B 272: 423–465.
Olson, S. L. 1973. A Classification of the Rallidae. *Wilson Bull.* 85: 381–416.
Ripley, S. D. 1977. *Rails of the World.* Toronto: Feheley.
Vuilleumier, F. & Gochfeld, M. 1976. Notes sur l'avifaune de Nouvelle-Caledonie. *Alauda* 44: 237–273.
Warner, D. W. 1947. The Ornithology of New Caledonia and the Loyalty Islands. Cornell Univ.: Ph.D. Thesis.

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Notes on the Yellow Tit *Parus holsti* of Taiwan with discovery of its nest

by W. F. Chang and S. R. Severinghaus

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The Yellow Tit *Parus holsti* is one of 14 species of birds endemic to the island of Taiwan (Severinghaus & Blackshaw 1976). It was discovered in 1894 by Seebohm's Swedish collector A. P. Holst (Seebohm 1895), and 57 years later Hachisuka & Udagawa (1951) wrote that its life history was still unknown. This paper presents information which has been gathered about the Yellow Tit since 1951, including the discovery of its nest.

Discovery of nests. The authors have observed Yellow Tits sporadically in the field since 1966, but it was not until 12 May 1976 that Chang found the first nest, and the next year 2 more on 15 April. As far as we know, these nests are the first ones reported.

The nests were found at 1250 m elevation in the hills of the Experimental Forest of National Taiwan University at Chitou, Nantou Co. (23° 30′ N, 120° 30′ E). The experimental forest covers 2488 hectares in the foothills of west central Taiwan. Two-thirds of this area has been cleared of its original hardwood vegetation and converted to plantations of conifers and bamboo. One-third of the area still remains as natural hardwood forest, and it was in these tracts of hardwoods that the three nests were found. Nests were not found in man-altered habitats.

The nests. One nest hole was 6 m above the ground in a 15 m high *Notophoebe konishi*, a large, uncommon hardwood, endemic to mountains in the central and southern parts of the island up to 2500 mm (Li 1963; Liu 1970). This same site was used in both the 1976 and 1977 breeding seasons, but we do not know whether it was occupied by the same pair. Dimensions of the nest cavity were as follows: hole diameter 11 cm, cavity depth 23 cm (from top of hole to bottom), cavity width 9 cm, depth of nest material 5 cm.

The other nest hole was 60 m away, 7·5 m above the ground in an *Actinodaphne mushaensis*, a common hardwood, endemic to mountain forests in the central part of the island (Li 1963; Liu 1970). Nest dimensions were not measured, but the hole appeared to be slightly smaller than the first. Nest materials at both sites were dried leaves (including bamboo leaves), lichens and moss, with some feathers in the cavity of the second site.

Eggs and young. The first nest discovered contained 3 young. On 13 May 1976, Chang observed the hole from 06.00 to 18.00 hours, during which 421 feeding trips were made to the nest by both parents. Greenish caterpillars were among the food items carried in. The young appeared to be 8–10 days old, which suggests that laying may have begun about mid-April. The next year (1977), Chang found 4 eggs on 15 April in this same nest cavity. One egg measured 17 mm x 12·5 mm. Another nest was discovered the same day with 3 eggs. The eggs were white with pinkish and brown splotches and streaks concentrated at the larger end. Dates of laying for these eggs are not known, but Chang observed the parents gathering nesting material on 1 April. Chang was unable to follow the nesting cycle through to completion in either case.

Species distribution. The first specimen of the Yellow Tit (a male) was collected by Holst on the "outlying spurs" of the Mt. Morrison (Yu Shan) range in central Taiwan (Seebohm 1895) and was described by Seebohm (1894). LaTouche (Ogilvie-Grant & LaTouche 1907) collected 3 specimens (males and females) in January and February 1906 at 6000 ft on the "Racu Racu Mts" (probably the range between Tung Pu Hot Springs and Patungkuan in Nantou Co.). Moltrecht collected a fifth specimen in the Alishan area (Chiayi Co.) in April 1907 (Ogilvie-Grant 1908). In summarizing what was known about the Yellow Tit in 1950, Hachisuka & Udagawa (1951) said that it was "confined to about 3,000 m" on Mts. Morrison and Ali (23° 30′ N, 120° 50′ E).

Our collective field experience indicates that the Yellow Tit is more widely distributed in the mountains than the above records suggest. We have seen them as far north as Mt. Lala (Taoyuan Co., 24° 43′ N, 121° 25′ E), as far south as Mt. Wutou (Pingtung Co., 22° 42′ N, 120° 47′ E), and in the mountains of the northeast near Ho Ping (Hualien Co., 24° 20′ N, 121° 40′ E). All our observations of Yellow Tits have been made between 1000 and 2300 m. Chen & Yen (1973) listed it as low as 800 m (Sun Moon Lake) in March. Hachisuka & Udagawa's (1951) reference to its being confined to 3000 m is an unaccountable error.

Habitat. The Yellow Tit appears to prefer primary hardwood forests between 1000 and 2300 m. We have seen them occasionally in primary mixed forests and in open second growth. We have not seen them in pure coniferous forests, which would occur at the 3000 m contour mentioned by Hachisuka & Udagawa.

Behaviour. Yellow Tits travel singly, in pairs, or as members of mixed species foraging flocks of babblers, minivets, warblers, flowerpeckers, nuthatches, flycatchers, and other tits. Whereas a mixed flock may have a number of Green-backed Tits *Parus monticolus*, only rarely will there be more than two Yellow Tits. Yellow Tits tend to feed and move in the canopy and upper understory of the forest.

Status. The Yellow Tit may never have been common in Taiwan. Today it is a rare resident. It appears to be more numerous in the southern half of the island than in the northern half, and in the western half of the mountains than the eastern half.

Their scarcity appears to be partly related to the scarcity of their preferred habitat, the primary hardwood forests which are disappearing under forestry practices (Schultz 1970). The Yellow Tit is one of several passerines in Taiwan whose future may depend on the preservation of tracts of virgin hardwood forests.

The endemic Yellow Tit may also be facing competition from its sympatric and more numerous congener the Green-backed Tit. These 2 species are ecologically and behaviourally similar, and they may compete for both food and nest sites. The Green-backed Tit appears to be less specialized than the Yellow Tit and may, therefore, have a competitive advantage.

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References:
Chen, P. H. & Yen, C. W. 1973. Ecological survey of the forest avifauna in Taiwan. *Annual Report* 1973. 37 pp. Tunghai University, Taichung, Taiwan.
Hachisuka, M. & Udagawa, T. 1951. Contributions to the ornithology of Formosa, Part II. *Quar. J. Taiwan Mus.* 4 (1 & 2): 1–180.
Li, H. L. 1963. *Woody Flora of Taiwan.* Livingston Publishing Co: Narberth, Pa.
Liu, Y. C. 1970. *Colored illustrations of important trees in Taiwan.* Taiwan Provincial Chung Hsing University: Taichung, Taiwan.
Ogilvie-Grant, W. R. 1908. Additional notes on the birds of Formosa. *Ibis.* (9)2: 600–608.
Ogilvie-Grant, W. R. & LaTouche, J. D. D. 1907. On the birds of the island of Formosa. *Ibis.* 1907: 151–198.
Schultz, R. D. 1970. Forest and forest industries development, Taiwan, Rep. of China. United Nations Development Program and Food and Agriculture Organization Final Report (FAO/SF: 84/CHA 21), Rome.
Seebohm, H. 1894. Two new birds from the interior of Formosa. *Bull. Brit. Orn. Cl.* 21: 7.
— 1895. On some new and little-known species of birds from Formosa. *Ibis.* 1895: 211–213.
Severinghaus, S. R. & Blackshaw, K. T. 1976. *A New Guide to the Birds of Taiwan.* Mei Ya Publications: Taipei.

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Black Kites *Milvus migrans* in Sumatra

by D. R. Wells

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Black Kites *Milvus migrans,* assumed to be of exclusively northern origin, now winter annually in the Malay Peninsula though numbers decline sharply south at least of 8° N. From field sightings Medway & Wells (1976) were able to provide slight evidence that occasional migrants cross to Indonesia. At the time we were unaware of a definite record but going over long-stored notes I find that on 13 and 14 April 1961 I saw single *M. migrans* (possibly the same individual) feeding with Brahminy Kites *Haliastur indus* at the mouth

of the Belawan river, northeast Sumatra (03° 45′ N, 98° 40′ E). They were larger than *Haliastur* with proportionately longer and shallow furcated tail, blackish brown with pale mottling on the head, venter and lower wing-coverts, and with a prominent white basal patch on the underside of the primaries.

Though overlooked by all recent authors, Medway & Wells included, the British Museum (Natural History) possesses a nineteenth century specimen (reg. no. 87.1.11.556) marked Sumatra. From label data I have assumed it to be the skin referred to *M. govinda* by Wardlaw Ramsay (1880) in a review of Sumatran material sent to the Marquis of Tweeddale by the Swedish explorer Carl Bock. It is an unsexed immature and on wing-length (456 mm maximum chord) falls actually within the zone of overlap of this northern tropical subspecies *M. m. govinda* with the eastern Palaearctic *M. m. lineatus* (Brown & Amadon 1968). The width of its pale ventral streaks, typically narrow in *govinda*, is also intermediate but a large white patch on the primaries like that of the Belawan bird(s) is suggestive of *lineatus*. Date and locality are not recorded, but according to Wardlaw Ramsay, Bock made his collection between August 1878 and January 1879 in the Padang region of western Sumatra. Bock (1882) himself mentions *M. govinda* in an appendix entitled 'List of birds collected in the highlands of the West Coast of Sumatra'. This appendix admittedly includes one or two normally lowland species, but Padang town, Bock's point of entry into West Coast province, is on its narrow coastal plain and he very probably took a few birds during journeys to or from the interior. It is reasonable therefore to accept this specimen as extending the known range of northern Black Kites in the Sunda region south to the equator.

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References:
Bock, C. 1882. *The head-hunters of Borneo*. Sampson Low: London.
Brown, L. H. & Amadon, D. 1968. *Hawks, Eagles and Falcons of the World*. Hamlyn: London.
Medway, Lord & Wells, D. R. 1976. *The Birds of the Malay Peninsula*. Vol. 5. H. F. & G. Witherby: London.
Wardlaw Ramsay, R. G. 1880. Contributions to the ornithology of Sumatra. Report on a collection from the neighbourhood of Padang. *Proc. Zool. Soc. Lond.*: 13–16.

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The genus *Criniger* (Pycnonotidae) in Africa

by G. D. Field

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The bearded bulbuls *Criniger* of the forests of west and equatorial Africa cause some difficulty to the taxonomist. There are 3 certain species: *olivaceus*, ranging from Sierra Leone to Ghana; *barbatus*, from Sierra Leone to the eastern Congo; and *calurus* from Guinea Bissau to Uganda. In the west there is no problem: *olivaceus* has a bright yellow throat and olive underparts, *barbatus* a pale yellow throat, greyish underparts, *calurus* a white throat and yellow underparts. In the east complications arise: the forms of *barbatus* from

Cameroon eastwards, the *chloronotus* group, have white instead of yellow throats, and Hall & Moreau (1970) "regard them as incipient species". Normal *C. calurus* extends over the whole area, but from Nigeria eastwards a bird virtually indistinguishable in appearance but with a finer bill occurs, *ndussumensis*, variously regarded as a race of *calurus* (Chapin 1948), a full species (Hall & Moreau 1970) "which may hybridise occasionally with it [*calurus*] in the eastern Congo", or a race of *olivaceus* (White 1956). This last view is followed by Mackworth-Praed & Grant (1973) who complicate the issue with the following sentence: "they [*C. olivaceus ndussumensis* and *C. calurus emini*] are, in fact, sibling species, only to be definitely known apart by the strength of the bill, if indeed they really are distinct species".

Chapin (1953) claimed that there was no distinction in habits and voice between *C. calurus emini* of most of the Congo and *C. c. ndussumensis* which he restricted to the Semliki valley and environs on the strength of the more rufous tails of the population there. However, as he did not appreciate that bill size was the only constant character dividing the two forms, he may not always have realised which form he was observing, and he remarks significantly that *C. c. emini* "at times was watched climbing with unexpected persistence on the bark of trees".

The key to the position of *ndussumensis* must lie in its behaviour. If it is specifically distinct from *calurus*, it will not sound and behave in exactly the same manner. My purpose here is to describe the behaviour of *C. olivaceus* in comparison with that of the other *Criniger* species in the hope that light may thus be shed on the eastern bird.

C. olivaceus is very rare in collections but is, in fact, moderately common in the most easterly primary forest in Sierra Leone where it is sympatric with the two larger, commoner, and more widespread species. Here there can be no possibility of confusion with *calurus*, throat colour being quite different. There can be momentary confusion with *barbatus* in the gloom of the forest where size is an unreliable guide, but the throat of *olivaceus* is a much brighter yellow and the underparts olive yellow instead of the darker, greyish olive of *barbatus*.

In Sierra Leone both *barbatus* and *calurus* are noisy and obtrusive members of the bird armies, though *barbatus* may also be found on its own. Their ringing cries, some of them difficult to differentiate, are often the first indication of the presence of these armies. Both inhabit the mid-interior of the forest from shrub layer to lower canopy, *barbatus* tending to keep lower than *calurus*. Both are mainly insectivorous but have been seen eating unidentified liane berries and *Musanga* fruit. Food is taken after a flight, the commonest technique being to seize prey off the leaves in flutter flight, and the same method is used with berries.

The behaviour of *olivaceus* is totally different. It is usually, though not always, with the bird armies, a silent bird, the only known calls being undistinguished little "chups". It is wholly insectivorous and food is obtained by searching the trunks and branches of trees, the birds clinging in an almost nuthatch-like manner, peering into crevices and even investigating the undersides of branches, thus more nearly approaching the *Phyllastrephus* mode of hunting than that of other *Criniger* species. Altitudinally, they range from stumps to the upper branches of trees, higher than is normal for the other

species. Any 'bearded bulbul' behaving in this manner can here at once be identified as *olivaceus*.

It remains for field studies to be made of *ndussumensis* in Nigeria or elsewhere. But I suspect that White will be found to have been right in making it a race of (or, if we prefer, a member of a superspecies with) *olivaceus*. Just as the yellow-throated *barbatus* of Upper Guinea gives place to a white-throated form, so the yellow-throated *olivaceus* gives place to a white-throated form, and Chapin's observations on behaviour take on an added significance once the behaviour of *olivaceus* is known. If this is so, field identification should be possible throughout the species' range.

References:
Chapin, J.P. 1948. *Auk* 65: 444.
— 1953. The Birds of the Belgian Congo. Pt. 3. *Bull. Amer. Mus. Nat. Hist.* 75A.
Hall, B.P. & Moreau, R. E. 1970. *An Atlas of Speciation in African Passerine Birds*. Brit. Mus. (Nat. Hist.): London.
Mackworth-Praed, C. W. & Grant, C. H. B. 1973. *Birds of West Central and Western Africa*. Vol. 2. Longmans: London.
White, C. M. N. 1956. Notes on the systematics of African bulbuls. *Bull. Brit. Orn. Cl.* 76: 158.

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Notes on sexual dimorphism and the nest of the Greenish Puffleg *Haplophaedia aureliae caucensis*

by Karl-L. Schuchmann

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The Greenish Puffleg *Haplophaedia aureliae* occurs in the subtropical zone from eastern Panama south to northern Bolivia (Meyer de Schauensee 1970). In the western Andes of southern Colombia *H. a. caucensis* is abundant in primary and secondary forests where it feeds and nests along trails and small rivers. It seldom leaves the dense vegetation or feeds at levels higher than 3 m (Schuchmann 1977). The hummingbirds of the Cauca Valley and the western Andes near Cali were the subject of a trapping programme in July/August 1976 and in January/February 1977. Data were collected on 10 individuals of the Greenish Puffleg trapped at km 15 on the road Cali to Buenaventura at an elevation of 2100 m.

No significant sexual differences in measurements could be found (Table 1). The oft-cited criterion of a more deeply forked tail in males (Zimmer 1951) could not be corroborated by examination of 4 specimens sexed by dissection.

Table 1

Mensural and weight characteristics of the Greenish Puffleg *Haplophaedia aureliae caucensis*.

Character	Sex	Mean	SD	SE	Range	No.
Wing (mm)	M	55.8	3.62	1.62	60.1–51.0	5
	F	55.6	1.49	0.67	57.0–53.0	5
Tail (mm)	M	39.6	2.42	1.42	44.0–37.0	5
	F	34.4	1.20	0.54	35.0–32.0	5
Bill (mm)	M	21.4	0.53	0.24	22.0–20.8	5
	F	21.5	0.40	0.18	22.0–21.0	5
Weight (g)	M	5.5	0.45	0.20	6.0– 4.9	5
	F	4.9	0.14	0.06	5.1– 4.7	5

Values of males and females were not significantly different at a probability level of 5% (Mann-Whitney U-test, Sokal & Rohlf 1969).

The only obvious sexual difference was a rufous-coloured patch on the *outer* side of the white tibial tufts in adult males (wholly lacking in females). Immature males have less pronounced tibial tufts with greyish dots. Hartert (1900) reported a similar sexual difference in the nominate race, but stated that the characteristic rufous patch of males is localized on the *inner* side of the tufts. Unfortunately, no comparable mensural characteristics are available from living specimens of *H. a. aureliae*. However, the wing length of 17 Senckenberg Museum skins are in close agreement with the range of wing measurements listed here for *H. a. caucensis*. Therefore, the position of the tibial colour patch in males is apparently the only obvious difference between the subspecies.

At the beginning of August 1976 a nest with one approximately 20-day old nestling (age based on my experience with successful breeding results of hummingbirds kept at our laboratory) was found along a trail in dense secondary forest. It was located 0·4 m above the ground in a hanging position attached to the inner side of a fern stem (Fig. 1). The cup-like nest was made entirely of moss, bound with a little cobweb, measuring 10 x 6 cm and 3·5 cm deep. The cup was lined with fine threads of plant material.

Nests of a hanging construction have previously been reported for the Tooth-billed Hummingbird *Androdon aequatorialis*, for the hermits *Glaucis, Threnetes, Phaethornis, Eutoxeres* by Ruschi (1965, 1973), Skutch (1964, 1972) and for the Blue-fronted Lancebill *Doryfera johannae* by Snow & Gochfeld (1977). Based on the form of the nest, Ruschi (1965) placed the hermit group at the end of his revised classification of the Trochilidae. However, this does not seem to be a very reliable criterion on which to base a classification in that (1) the nest form of many hummingbird species is still unknown, and (2) in at least one genus, *Doryfera*, 2 species have strikingly different nests (Snow & Gochfeld 1977). It is more likely that the nest construction depends mainly on the ecological adaptations of the species, as proposed by Koepke (1972). Accordingly, the hanging nest here reported should be considered to reflect the life history and not the phylogeny of the Greenish Puffleg.

Acknowledgements: I am grateful to C. T. Collins, L. F. Kiff, F. G. Stiles and L. L. Wolf for valuable comments on an earlier draft of the manuscript.

References:

Hartert, E. 1900. *Das Tierreich 9*. Friedl. & Sohn: Berlin.
Koepke, M. 1972. Über die Resistenzformen der Vogelnester in einem begrenzten Gebiet des tropischen Regenwaldes in Peru. *J. Orn.* 113: 138–160.
Meyer de Schauensee, R. 1970. *The Birds of South America*. Livingston: Pennsylvania.
Ruschi, A. 1965. A posicao mantida no ninho pelas femeas de beija-flores durante a incubacao, e durante o aquecimento da prole. *Bolm. Mus. Biol. Prof. Mello-Leitao* 48: 1–3.
Ruschi, A. 1973. *Beija-Flores*. Mus. Prof. Mello-Leitao. R. J.
Schuchmann, K.-L. 1977. Geschlechtsmerkmale, Lebensraum und brutbiologische Beobachtungen von *Coeligena coeligena ferruginea* (Chapman 1917). *Senckenbergiana biol.* 58: 137–141.
Skutch, A. F. 1964. Life histories of hermit hummingbirds. *Auk* 81: 5–25.
Skutch, A. F. 1972. Studies of tropical American birds. *Publ. Nutt. Ornith. Club,* No. 10.
Snow, B. K. & Gochfeld, M. 1977. Field notes on the nest of the Green-fronted Lancebill *Doryfera ludoviciae* and the Blue-fronted Lancebill *Doryfera johannae*. *Bull. Brit. Orn. Cl.* 97(4): 121–125.
Sokal, R. R. & Rohlf, J. F. 1969. *Biometry*. Freeman & Co: San Francisco.
Zimmer, J. T. 1951. Studies of Peruvian birds No. 61. *Amer. Mus. Nov.* No. 1540.

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Photo: Schuchmann

Fig. 1. Nest with a 20-day old nestling of the Greenish Puffleg *Haplophaedia aureliae caucensis*.

Sooty Falcon *Falco concolor* at Kitwe, Zambia, 10 March 1978. By E. H. Penry

Sight records of the Sooty Falcon *Falco concolor* in Zambia

by E. H. Penry

Received 23 February 1979

According to Dowsett (in Snow 1978), the Sooty Falcon *Falco concolor* breeds in the Libyan desert and the Red Sea area, and winters in Madagascar, although there are also records from coastal southeastern Africa for December to March. From the intervening area the only records are from coastal eastern Africa northwestwards to the vicinity of Lake Victoria. The passage routes are not properly known. The following is an account of some sightings in Zambia.

On 26 November 1977 at 1800 hrs a falcon was catching termites over a road in Kitwe, 12° 48′ S, 28° 14′ E, outside a petrol station. Since the European Hobby *F. subbuteo* had not yet been seen that autumn on southward passage over Kitwe, I examined the bird through binoculars to confirm that it was that species. It proved to be wholly grey above and below. It was hunting termites only 20–30 ft above the road, frequently right above my head, so that I was able to study it closely. The cere and orbits were bright yellow, feet orange yellow. Termites were caught in the talons, and transferred immediately to the beak. The upperside was uniformly grey from head to tail, apart from faint areas of dusky brown on the upper wing-coverts, and the primaries were darker but not obviously black. Below it was also wholly grey apart from indistinct fine dusky streaks on the breast. Against the light the under surface of the fanned rectrices appeared as barred with black. Such barring was not apparent with the light on the upper surface, which appeared plain grey, concolorous with the rump and back. As the bird was in moult (a few remiges apparently absent, rectrices with irregular ends), it was not possible to determine the shape of the tip of the tail. The wings were relatively long even for a falcon, and the whole impression was compatible with my sightings of *concolor* in Madagascar in November 1976. It perched for some 20 seconds in the lower branch of a large tree across the road, but I could not get a clear enough view to compare the length of the wing with that of the tail. While perched it seemed to be cleaning its talons with its beak. It flew off shortly before I left the garage. Within 5 minutes the heavily overcast sky burst in a rainstorm. Darkness fell 30 minutes later.

The species most likely to be confused with *concolor* is the Grey Kestrel *F. ardosiaceus*, and these two are reputedly difficult to distinguish in the field (Brown & Amadon 1968: 792, 823). I do not know the latter in life, but my reasons for identifying the bird as *concolor* are: (1) *F. ardosiaceus* is resident wherever it occurs. It is only known in Zambia by a sight record from the extreme northeast (Jones 1974). (2) The date coincides with those of the main passage of *concolor*, and a wanderer to Zambia at this time is not surprising. (3) The weather was stormy, and migrant falcons are well known for appearing before or after storms. They probably depend on this elemental factor for a flush of termites. (4) The bird resembled those I had already seen in Madagascar. The long wings are in keeping with *concolor*. The blackish spot below the eye mentioned by Brown & Amadon (1968: 823) was not noted, although this character was not looked for (in any case, judging from skins, it would not necessarily be conspicuous). The size, although not a reliable character without both species for comparison, was larger than one

would expect for *ardosiaceus*. The wing-shape was definitely "falcon", not "kestrel". Behaviour and flight were "falcon"; wing-beats strong and purposeful, not weak and delicate as in a kestrel. At a distance the appearance was dark and hobby-like, not the rather paler grey that might be expected of *ardosiaceus*. (5) There was no "face-pattern", so confusion with the hobbies *subbuteo* and *cuvieri* is out of the question, while the red-footed falcons *vespertinus* and *amurensis* are well known to me.

Another sighting of a *concolor* was obtained on 10 March 1978 at my home in Kitwe only 1 km away from the previous one. The time was 1645 hrs, and the sky was completely covered in a blanket of cloud. A storm was looming up from the southeast. A falcon flew over my head, into the top of a 25 m high tree in a neighbour's garden. It perched in an upright position on a bare branch right at the top of the tree, and my wife and I were able to observe it for the next half-hour. During this time it flew off on 4 occasions for 1–2 minutes before returning to the same perch. It was almost identical with the bird seen the previous November. It differed materially only in that the wings and tail had all the feathers complete and, probably owing to the greater distance from the observer, no streaking on the underside was visible, and no barring on the tail was discerned. The following are the main identification points:— (1) The closed wings projected beyond the tip of the tail (see Plate). (2) In flight the wings appeared long, and this was more noticeable at a distance. (3) The colour was uniform mid-grey, slightly lighter on the underside. (4) The cere and orbits were yellow; feet orange. (5) The flight was strong and falcon-like. (6) The underside of the wings was plain, not barred as in *ardosiaceus*. (7) The tail appeared slightly rounded when closed (cf. Brown & Amadon 1968: 823). At 1710 hrs, as the first large drops of rain fell, the bird flew off in a northwesterly direction, and did not return. Over the next 24 hours there was almost continuous rain and a heavily overcast sky, quite unusual for the time of year.

On 12 March 1978 a long-winged, uniformly coloured falcon was seen near Chingola, 12° 31′ S, 27° 53′ E, over farmland and woodland about 5 km west of the town at 1030 hrs. In view of the sighting in Kitwe only 2 days previously it was identified as a probable *concolor*. On 28 April 1978 at 1600 hrs a servant reported that "the bird with two tails" (a reference to the projections of the wings beyond the tail, as in the Plate) was back on the tree in a neighbour's garden. P. St J. Bowen and I observed it through binoculars for 10 minutes, and virtually all the same characters were noted as in the observation on 10 March. It is unlikely that this was the same individual. The impression was indeed of a slightly smaller bird, with legs more orange. On 14 November 1978 at 1400 hrs a falcon flew into the top of the very same tree, and I instantly recognised it as being the same species. Observation confirmed it as uniformly grey and long-winged, with yellow cere and orbits, and orange-yellow legs. It flew out of the tree, to return to the same perch at the very top twice before finally departing. Again the weather was heavily overcast, and a storm was looming up from the southeast.

Particular stress must be laid on the relatively short tail of *concolor*. Brown & Amadon (1968: 823) give only wing-lengths, but (p. 792) give both wing- and tail-lengths for *ardosiaceus*, indicating a wing/tail ratio of c. 1.56. On the other hand, using five specimens in the University Museum of Zoology, Cambridge (tails 123, 123, 132, 133, 137 mm) in *concolor* the ratio is as high

as c. 2.12. Also, D. A. Turner, who has examined an original of the Plate, and knows both species in life (*concolor* in Madagascar, *ardosiaceus* in East Africa), has assured me that the tail is much too short for an *ardosiaceus*. Furthermore, the habit of returning repeatedly to the same perch is characteristic of *concolor*, but not of *ardosiaceus*. All these Zambian sightings seem to be of adults, in view of the general uniformity in colour of plumage (Brown & Amadon 1968: 823), although specimens in immature plumage are well enough known from the wintering area in Madagascar (there are 4 such in Cambridge and 2 in the Merseyside County Museum, Liverpool which I have examined). The association with a residential area is also worth comment. My house in Kitwe is on a hill, with the tall tree in my neighbour's garden a prominent feature. In Madagascar in November 1976, *concolor* was in numbers around Tananarive airport, and in *Eucalyptus* trees in a residential area near the town.

Falco concolor has not previously been recorded from Zambia, although Benson *et al.* (1971) indicate it as of likely occurrence. There are still further possible records. D. R. Aspinwall (*in litt.*) observed a grey falcon at Chama, 11° 14′ S, 33° 11′ E, in December 1976, and two such at Mkushi, 13° 38′ S, 29° 23′ E, on 23 or 24 October 1977. Perhaps the species is overlooked owing to its similarity to *subbuteo* at a distance. At any range immature birds could easily be confused, and indeed a specimen was originally provisionally identified as *subbuteo* (Clancey 1969).

Clearly the movements of *concolor* merit further study. The main wintering area is Madagascar. To what extent (if any) it may also winter in coastal eastern Africa is uncertain. The 3 such records from southeastern Africa are for 13 and 26 December, and 13 March (Clancey 1969), not quite the same as "December to March" (Dowsett, in Snow 1978). They might refer merely to lost individuals.

The record from Kitwe for 28 April seems unusually late for a migrant falcon, but *concolor* (and *eleonorae*) breed after the summer solstice. This locality may be near the western periphery of both the northern and southern passage routes. The most westerly locality north of the equator, perhaps a breeding locality, in Snow (1978: map 118) is at 14° N, 21° E, evidently derived from Salvan (1968: 57). There is no reason to doubt it, since Salvan collected a specimen, and also records *ardosiaceus*.

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References:

Benson, C. W., Brooke, R. K., Dowsett, R. J. & Irwin, M. P. Stuart. 1971. *The Birds of Zambia*. London: Collins.

Brown, L. & Amadon, D. 1968. *Eagles, Hawks and Falcons of the World*. London: Country Life Books.

Clancey, P. A. 1969. *Falco concolor* Temminck in South Africa. *Bull. Brit. Orn. Cl.* 89: 10–11.

Jones, B. W. 1974. Sight record of a Grey Kestrel (*Falco ardosiaceus*) in Sumbu National Park. *Bull. Zambian Orn. Soc.* 6(1): 25.

Salvan, J. 1968. Contribution a l'étude des oiseaux du Tchad (2nd part). *L'Oiseau & R.F.O.* 38: 53–85.

Snow, D. W. (Ed.). 1978. *An Atlas of Speciation in African Non-passerine Birds*. London: Brit. Mus. (Nat. Hist.).

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Atlas of speciation in African non-passerine birds – *Addenda* and *Corrigenda*

by D. W. Snow

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Since the publication of the African non-passerine *Atlas*, in August 1978, a number of errors have been pointed out to me. There will be no opportunity to publish a list of *Corrigenda* in any subsequent volume, as there was for the passerine *Atlas* by Hall & Moreau (*Corrigenda* for which are given on p. 384 of the non-passerine *Atlas*), and so I am much indebted to the Editor for allowing me space to set them out here. It is hoped that in this way they will come to the attention of most users of the book, who will be able to make the necessary corrections.

I am especially grateful to Mr. C. W. Benson, who has worked through the *Atlas* in detail and detected many of the items listed below.

Map 19. *Butorides striatus*. Occurs throughout the Comoro Islands.

Map 12. *Ixobrychus minutus*. Recorded breeding on the Guinea coast at about 11° N (Naurois 1969, *Mem. Mus. Nat. Hist. Nat. Paris* 56: 208).

Map 14. *Gorsachius leuconotus*. Recorded breeding on the Bijagos Is. off the Guinea coast at about 11½° N (Naurois 1969, *loc. cit.*: 225).

Map 15. *Nycticorax nycticorax*. Recorded breeding on the Bijagos Is. (Naurois 1969, *loc. cit.*: 224–229).

Map 26. *Ardea goliath*. Recorded breeding on the Bijagos Is. at about 11½° N (Naurois 1969, *loc. cit.*: 225).

Map 27. *Ardea humbloti*. Recorded in the Comoros as follows: Moheli (Benson 1960, *Ibis* 103b: 32), Mayotte (Forbes-Watson 1969, *Atoll Res. Bull.* 128: 9).

Map 37. *Threskiornis aethiopica*. Breeds on Aldabra, Indian Ocean.

Map 57. *Anas capensis*. The record near Ndola, Zambia (12° 58′ S, 28° 39′ E), is based on a misidentified specimen of *A. querquedula* (Benson *et al.* 1970, *Arnoldia* 4(40): 5).

Map 66. *Torgos tracheliotus*. Recorded breeding at the extreme west of the range from the Senegal River to the Saloum delta (Morel 1972, *Liste Commentee Ois. Senegal et Gambie*).

Map 75. *Circus ranivorus* superspecies. *C. aeruginosus* (same form as in Madagascar) occurs in all 4 Comoro Islands.

Map 102. *Aquila rapax*. Delete the 3 breeding records from Malawi, where the species is known only as a non-breeder.

Map 106. *Milvus migrans*. Breeds on both S. Tomé and Principe (Naurois, *in litt.*) in the Gulf of Guinea.

Map 115. *Falco cuvierii*. Delete the 2 registrations south of Lake Malawi (based on misidentified specimens).

Map 116. *Falco chicquera*. Delete the 2 Madagascar registrations (cartographic error).

Map 122. *Francolinus squamatus* species-group. Delete the registration just south of 10° S, west of Lake Malawi (cartographic error).

Map 130. *Coturnix coturnix*, line 8 of text. Palaearctic migrants do not go south of the Equator (Benson & Irwin 1966, *Arnoldia* 2(13)).

Map 137. *Guttera edouardi* superspecies. Delete the registration for *G. edouardi* on Mt. Kilimanjaro (cartographic error).

Map 138. *Numida meleagris*. Madagascar records of *mitrata* almost certainly represent introductions. The species has also been introduced into the Comoros.

Map 149. *Rallus caerulescens*. Record from S. Tomé, Gulf of Guinea, probably acceptable (Bannerman 1931, *Bds Trop. W. Africa* 2: 10; specimen destroyed); the species has now been recorded from Cameroun (J. Parrott, *in litt.*). I have been unable to find the authority for the occurrence of the species in Sierra Leone (Praed & Grant 1970, *Bds W.C. & W. Africa*).

Map 162. *Balearica pavonina*. Recorded breeding at about 11° N on the Guinea coast (Naurois 1969, *loc. cit.*: 209).

Map 177. *Vanellus crassirostris*. All the points have been swivelled anticlockwise with a centre of rotation near the southern extreme of the range. The 2 northernmost points should lie astride the southern part of Lake Chad, the easternmost point should be near the mouth of the Tana River, and the southernmost should be at about 28° S, just inland from the Natal coast.

Map 182. *Vanellus coronatus, V. superciliosus*. The symbol at Kasaji (c 10½° S, 23½° E) refers to *superciliosus* and should be a black triangle.

Map 211. *Columba guinea*. Delete the registration at about 12° S, 29° E, and the 2 at about 11° S, just east of Lake Malawi.

Map 212. *Columba arquatrix* species-group. Delete the registration at about 11° S, near the source of the Zambezi (corrected to Rugege, Rwanda, by Schouteden 1971, *Doc. Zool.* 17: 75).

Map 222. *Aplopelia larvata*. Delete the registration at about 15° S, north of Lake Kariba.

Map 228. *Treron calva* superspecies. An endemic race of *T. calva* occurs on Principe in the Gulf of Guinea (Amadon 1953, *Bull. Am. Mus. Nat. Hist.* 100: 411).

Map 233. *Psittacula krameri*. Delete the 2 records in Somalia—one (Berbera) based on presumably captive or introduced specimen, the other on confusion of place name.

Map 263. *Otus leucotis*. Map 266. *Bubo africanus*. Map 268. *Bubo lacteus*. All three species occur in Senegal north at least to Richard-Toll, c. 16½° N (Morel 1972, *loc. cit.*).

Map 287. *Macrodipteryx longipennis* species-group. The 2 records of *longipennis* in southwest Tanzania are based on misidentified specimens of *vexillarius* (Dowsett & Stjernstedt 1973, *Puku* 7: 114).

Map 291. *Neafrapus boehmi, N. cassini*. Delete the registration for *N. boehmi* on Mt. Elgon (cartographic error).

Map 299. Text. Delete superscript 3 in last line.

Map 303. *Ceryle maxima* superspecies, line 14 of text. For "*torquata*" read "*maxima*".

Map 305. *Alcedo semitorquata* superspeices, etc. The symbols for *semitorquata* and *quadribrachys* are transposed in the map caption.

Map 318. *Merops breweri*. Recorded from the Afram River, Ghana (Bannerman 1953, *Bds W. & Equ. Africa* 1: 679).

Map 327. *Coracias spatulata*. Delete registrations at c 4° S, 20° E and 22° S, 21° E (cartographic errors).

Map 345. *Lybius minor, L. melanopterus.* Delete the registration of *minor* at c 14° S, 31° E, east of the Luangwa River (in fact at Mbala, formerly Abercorn, cf. Benson *et al.* 1971, Bds Zambia: 379).

Map 356. *Pogoniulus olivaceus.* There is an additional record of *woodwardi* from Nchingidi at about 10° S in coastal Tanzania (Peters & Loveridge 1942, *Bull. Mus. Comp. Zool.* 89: 241).

Map 359. *Pogoniulus pusillus* superspecies. The symbols for *pusillus* and *chrysoconus* are transposed in the map caption.

Map 361. Column 2, line 10 of text. For "*subsulphureus*" read "*chrysoconus*".

Page 380. Add footnote reference as follows: Map 99. 1. Martin & Martin 1976, *Bokmakierie* 28: 70–72.

Page 381. Add footnote references as follows:

Map 183. 1. Wolters, *loc. cit.*
2. Dowsett 1977, *Scopus* 1: 73–78.
3. Clancey 1964, *Bds Natal & Zululand*: 156–157.
4. Sessions 1975, *Bull. E.A.N.H.S.*, April: 46.
5. Praed & Grant 1970, *Bds W.C. & W. Africa* 1: 257.

Map 240. 1. Clancey 1973, *Durban Mus. Novit.* 10: 1–11.

Page 383. Map 377. Alter reference 4 to: Benson 1952, *Ostrich* 23: 152.

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Some additional observations on haematozoa of birds in the Mascarene Islands

M. A. Peirce

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The results of the 1974 survey of haematozoa of birds in the Mascarene Islands (Peirce *et al.* 1977) indicated the need for more material, especially from Rodrigues where only a small sample had been obtained.

Recently, it has been possible to examine a small number of blood smears from sea-birds on Round Island taken by the Edinburgh University Expedition during August 1978, and a larger sample from Rodrigues and Mauritius by A. S. Cheke in September 1978, the results of which are reported here. Data on localities and details of the preparation, staining and subsequent examination of blood smears are given in Peirce *et al.* (1977), the only exception being that from sea-birds blood was drawn from the tibial vein.

Results

A total of 69 birds was examined (Table 1) of which 16 were found to harbour haematozoa. No parasites were seen in any of the birds from Round Island. From Solitude, on Rodrigues, 12 birds (27.9%) were observed to be parasitized with *Leucocytozoon* or *Plasmodium*. The *Leucocytozoon* parasites in *Foudia flavicans, F. madagascariensis* and *Passer domesticus* were of low parasitaemias but thought to be *L. fringillinarum.*

The *Plasmodium* parasites were particularly interesting. None of the birds had a high level of parasitaemia and most parasites seen were trophozoites or schizonts, all of which were considered to represent one species only. In the erythrocyte the parasite usually occupies a polar position although some are

TABLE 1

Blood parasites of birds on Rodrigues, Mauritius and Round Island (August–September 1978)

Bird species	No. examined/ No. infected	Parasites found L	P
RODRIGUES			
COLUMBIDAE:			
Barred Ground Dove *Geopelia striata*	2/0	–	–
PLOCEIDAE:			
Madagascar Fody *Foudia madagascariensis*	17/3	2	1
Rodrigues Fody *F. flavicans*	13/4	1	3
House Sparrow *Passer domesticus*	11/5	4	2
MAURITIUS			
COLUMBIDAE:			
Barred Ground Dove *G. striata*	2/0	–	–
ZOSTEROPIDAE:			
Mascarene Grey White-eye *Zosterops borbonica mauritiana*	3/3	3	–
Mauritius Olive White-eye *Z. chloronothos*	1/1	1	–
PLOCEIDAE:			
Madagascar Fody *F. madagascariensis*	1/0	–	–
ROUND ISLAND			
PROCELLARIIDAE:			
Wedge-tailed Shearwater *Puffinus pacificus*	5/0	–	–
Trinidade Petrel *Pterodroma arminjoniana*	5/0	–	–
PHAETHONTIDAE:			
White-tailed Tropicbird *Phaethon lepturus*	5/0	–	–
Red-tailed Tropicbird *P. rubricauda*	4/0	–	–
Totals	69/16	11	6

L = *Leucocytozoon* P = *Plasmodium*

lateral; the host cell nucleus is frequently displaced, either to the periphery of the cell or rotated through 90°; schizonts are irregular in shape (one seen as a horse-shoe), fairly small with 4 large merozoites; the pigment granules are round, usually 3 (range 2–5), one usually larger than the others, clumped together peripherally; gametocytes are scanty but appear round or slightly irregular (too few for proper designation). The identity and status of this species is still undetermined.

One *P. domesticus* had a mixed infection with *L. fringillinarum* and *Plasmodium* sp.

All 3 *Zosterops borbonica* and one *Z. chloronothos* from Alexandra Falls, on Mauritius, were infected with *L. zosteropis*.

In addition to the data given in Table 1, 2 birds, both *F. flavicans,* were found to be parasitized with a Rickettsia-like organism similar to that observed in other birds in 1974. One of the birds was a re-trap from 1974 when no infection was detected.

Discussion

The sample from Rodrigues was larger than before (43:16) and there were some differences in the parasites observed, particularly the absence of trypanosomes. These were found in a single *F. madagascariensis* in December 1974, whereas at that time no plasmodia were seen. These differences may reflect seasonal fluctuations in patency corresponding to vector activity, or merely relapses rather than initial infections; low parasitaemias suggest the latter is not the case.

Although *Plasmodium* spp. are frequently difficult to identify, even with

heavy infections, due to morphological differences within strains of the same species, the morphology of the present parasite does not appear to resemble any known species, and especially those previously observed on Mauritius (*P. relictum* and *P. vaughani*). Further work is indicated to elucidate the identity and status of this parasite.

Some species of *Leucocytozoon* can also exhibit a variable morphology but gametocytes of *L. fringillinarum* are usually round. Although no such gametocytes were seen in any of the large number of *Zosterops* infected with *L. zosteropis* examined in 1974, some other passerine species infected with *L. fringillinarum* did have a few gametocytes more closely resembling *L. zosteropis*. At the time these were considered to be abnormal *L. fringillinarum* because *L. zosteropis* was thought to be restricted to the Zosteropidae. However, some gametocytes in the recent material from Rodrigues also show a morphological resemblance to *L. zosteropis*, even though no *Zosterops* occur on the island. This raises the question as to whether *L. zosteropis* can and does occur in other species. Observations made on present and past material suggest that *Zosterops* are immune to *L. fringillinarum* whereas other passerine species may be susceptible to infection with *L. zosteropis*. The work of Bennett & Cameron (1975), who showed that mixed infections of *L. fringillinarum, L. dubreuili* and *L. majoris* are possible, does give some validity to the possibility of a similar situation occurring in the Mascarenes. Those species of *Leucocytozoon* whose vectors are known are, with one exception, transmitted by simuliids, and in Mauritius and Réunion only one species is known, *Simulium ruficorne* (Peirce *et al.* 1977). A. M. Hutson (British Museum (Natural History) *pers. comm.*) confirms that *S. ruficorne* also is the only species known from Rodrigues, but adds that recent material collected in Réunion suggests that a second species may be present. Therefore, it seems likely that *S. ruficorne* is the vector of all three species of *Leucocytozoon* known to occur in the Mascarenes (*L. fringillinarum, L. marchouxi* and *L. zosteropis*), at least on Mauritius and Rodrigues. Further, it is possible that in areas inhabited by several bird species, some vectors may be harbouring development of more than one species of *Leucocytozoon*. Thus in biting a new host a vector could transmit sporozoites of more than one species, which would account for the apparent infection of some ploceids with *L. zosteropis*. It can be postulated that probably since the *Zosterops* are endemic species, *L. zosteropis* has evolved in this genus. Other avian species introduced into the Mascarenes probably brought infections such as *L. fringillinarum* and *L. marchouxi* with them, and the single simuliid vector has been able to adapt to transmitting both the established species (*L. zosteropis*) and those introduced. This would possibly explain the low infection rates with *Leucocytozoon* in species other than *Zosterops,* since an evolutionary pattern is probably still in the process of evolving. Since the endemic ploceids exist in relatively small numbers by comparison with the *Zosterops*, probably these have not played any significant role in the development of host-parasite-vector relationships.

This intriguing situation suggests that a more intensive survey is required, including collection of data on seasonal activity and transmission studies.

The negative results from the sea-birds on Round Island are probably due to a too small sample rather than an absence of parasites in the population. The only previous samples from Indian Ocean sea-birds (Lowery 1971, Peirce & Feare 1978) indicate that infection rates are usually low.

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References:
Bennett, G. F. & Cameron, M. F. 1975. Mixed infections of species of *Leucocytozoon* in individual birds from Atlantic Canada. *J. Parasit.* 61: 1091–1095.
Lowery, R. S. 1971. Blood parasites of vertebrates on Aldabra. *Phil. Trans. Roy. Soc. Lond.* B.260: 577–580.
Peirce, M. A., Cheke, A. S. & Cheke, R. A. 1977. A survey of blood parasites of birds in the Mascarene Islands, Indian Ocean, with descriptions of two new species and taxonomic discussion. *Ibis.* 119: 451–461.
Peirce, M. A. & Feare, C. J. 1978. Piroplasmosis in the Masked Booby *Sula dactylatra melanops* in the Amirantes, Indian Ocean. *Bull. Brit. Orn. Cl.* 98: 38–40.

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The Grey Sunbird *Nectarinia veroxii* in southern Malawi

by D. B. Hanmer

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Benson & Benson (1977: 188) suggest that *Nectarinia veroxii* might occur very sparsely in the lower Shire valley in Malawi and draw attention to its occurrence in the lower Zambezi valley (see also Clancey 1971: 109). This has now been confirmed, since on 9 November 1978 at Nchalo, 16° 16′ S, 34° 55′ E, I netted (and after study released) a sunbird unquestionably of this species.

Description: Upperparts, from head to upper tail-coverts, and upper wing-coverts, dark grey (head slightly darker) with pale bluish green metallic sheen. Sides of head lighter grey, shading into pale grey on underparts as a whole (slight tinge of yellowish on lower abdomen and under tail-coverts). Under wing-coverts white. Flash on each side of chest red, with two yellow feathers on each side. Remiges and rectrices brownish grey, with bluish sheen on upper surface. Eye dark brown. Bill fairly well curved, black, with a bright orange swelling on each side at base; feet black.

Measurements and weight: Wing 55, tail 39, culmen from skull 21, tarsus 16 mm. Weight 9·1 g.

The bird was evidently immature, as indicated by the swellings at the base of the bill and the tinge of yellowish on the lower abdomen (Mackworth-Praed & Grant 1963: 505 write of the young bird being washed with yellowish below). Also, it was in heavy body moult, the metallic feathers not fully grown.

It can be safely assumed that the subspecies at Nchalo is *N. v. fischeri*, and that this particular individual, wing 55 mm, was a female (see for example Mackworth-Praed & Grant (1963), White (1963: 81), Clancey (1971: 109)). Again for example, for the nominate form Mackworth-Praed & Grant give wing 62–68 mm in the male, 56–60 mm in the female, as against *fischeri* respectively 61–63, 55–56 mm. The pectoral flashes are usually described as red (as by Clancey 1964: 434). However, Mackworth-Praed & Grant describe them as red and yellow, so that the presence of a little yellow in the Nchalo specimen is not surprising. Furthermore, of 42 specimens of the species as a whole in the British Museum (Natural History), the Bensons (pers. comm.) found

a single wholly yellow feather in each of 19. Also, in about half of the 42, yellow was hidden at the base of the odd red feather.

The bird was caught in dry grassland with leafless scrub, adjoining (within 10 m) a hedge of thicket around my vegetable garden. Two had been seen at the same spot in the previous fortnight. The same bird was recaught on 23 November 1978 in thicket 300 m from the place of first capture and weighed 8·9 g. Body plumage was still in heavy moult with the metallic feathers not fully grown. I have no other record of the species since taking up residence at Nchalo in 1973. Like *Apalis ruddi* (cf. Hanmer 1979), this may be another case of a species driven out of its normal habitat into a housing area through bush clearance.

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References:
Benson, C. W. & Benson, F. M. 1977. *The Birds of Malawi*. Limbe: D. W. K. Macpherson (Sponsor).
Clancey, P. A. 1964. *The Birds of Natal and Zululand*. Edinburgh & London: Oliver & Boyd.
— 1971. *A Handlist of the Birds of Southern Moçambique*. Lourenço Marques: Inst. Invest. Cient. Moç.
Hanmer, D. B. 1979. An undescribed subspecies of Rudd's Apalis *Apalis ruddi* from southern Malawi. *Bull. Brit. Orn. Cl.* 99: 27–28.
Mackworth-Praed, C. W. & Grant, C. H. B. 1963. *Birds of the Southern Third of Africa*, Vol. 2. London: Longmans.
White, C. M. N. 1963. *A Revised Check List of African Flycatchers*, etc. Lusaka: Dept. of Game & Fisheries.

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A new northern subspecies of the Tropical Gnatcatcher *Polioptila plumbea*

by Kenneth C. Parkes

Received 22 January 1979

The gnatcatchers, genus *Polioptila*, constitute a New World group of uncertain affinities, generally placed as a subfamily of either the Old World warblers (Sylviidae) or the enlarged family Muscicapidae, the "Old World insect eaters," as in the "Peters" check-list. The genus is primarily tropical, with one species (*caerulea*) widespread in the United States and 2 others (*melanura* and *nigriceps*) reaching north only to the southwestern U.S., the latter having been only recently detected breeding in Arizona (Phillips *et al.* 1973). Species limits within the genus are fairly well understood, but there is one group of forms from Mexico and Central America for which the early literature is hopelessly confused and must be disregarded. The history of this confusion was well documented by Phillips (1962) and Phillips *et al.* (1973) and in both of these papers the characters and distribution of the 3 problem species *nigriceps*, *albilora*, and *plumbea* are presented along with keys for their identification.

The most widely distributed species in the genus is the Tropical Gnatcatcher *P. plumbea* with a range extending from southern Mexico to Peru and Brazil. The northernmost populations have been confused especially with

P. albiloris, and many collections undoubtedly still contain misidentified and mislabelled specimens. After having gone over the material of this group in Carnegie Museum of Natural History, it became apparent to me that the name *Polioptila plumbea superciliaris* Lawrence, 1861, currently used for all Tropical Gnatcatchers from Mexico through Panama, applied only to the southern populations within this range, and that the northern populations constitute an unrecognized subspecies. With the help of additional specimens examined at the American Museum of Natural History, I was able to work out the respective ranges of the 2 races. The type locality of *P. p. superciliaris* is the Atlantic slope of Panama, along the Panama Railroad line. Two other names for populations of *P. plumbea* within the area under discussion have been proposed. One is *Polioptila superciliaris magna* Ridgway, 1903, for which the type locality is Cartago, Costa Rica. It was based on a single female, said to be "decidely larger (except length of tarsus) than *superciliosa* [*sic.* = *superciliaris*]". Ridgway's own measurements (1904: 728–729) indicate that the holotype, with a wing length of 47.5 mm, exceeded the largest of his series of 10 female *superciliaris* by 3.5 mm, but its tail length of 43 fell well within the range of 36.5–49.5 given for *superciliaris.* The wing of the holotype of *magna* is only 0.5 mm longer than the largest Panama female of *superciliaris* I measured, and females from Costa Rica and Panama had almost identical ranges and means of wing length (Costa Rica, 44–47.5 [45.5]; Panama, 44–47 [45·25]). Ridgway also considered the holotype of *magna* to be somewhat darker than *superciliaris,* but his series of the latter was a composite, including the paler subspecies to be described below. The name *magna* is therefore considered to be a synonym of *superciliaris.*

Wetmore (1957) described as *Polioptila plumbea cinericia* the population of Isla Coiba, off the coast of Veraguas, Panama. However, he compared it only with *bilineata*, the race of northwestern South America, to which he apparently assigned mainland Panama birds. The characters described for *cinericia* are those that differentiate *superciliaris* from *bilineata*, and the single Isla Coiba specimen I examined was no darker in colour than others from the Panama mainland. A larger series from Isla Coiba may show *cinericia* to be a valid race, but this question does not affect the nomenclature of the northern population, which may be called:

Polioptila plumbea brodkorbi subsp. nov.

Holotype: adult male; Carnegie Museum of Natural History No. 99884; Duck Run (also called Benque Ceiba), on the Belize River below (=east of) Cayo, western British Honduras (now Belize); 14 April 1926; collected by Ernest G. Holt; original number 1069.

Diagnosis: differs from all races of *P. plumbea* except *P. p. superciliaris* Lawrence and *P. p. bilineata* (Bonaparte) in having a white superciliary in the male; nearest in colour to *bilineata* of northwestern South America rather than to the adjacent race *superciliaris.* Both sexes differ from *bilineata* in having the dorsum somewhat purer (less brownish) grey; edgings of remiges greyer (less whitish, in this respect agreeing with *superciliaris*); white more extensive on tips of rectrices 4 and 5. Adult females have the crown darker grey, slightly glossy, contrasting more with the dorsum than in *bilineata.* Females of *bilineata* have a black spot at the edge of the crown behind the ear coverts, lacking in *brodkorbi.*

From the geographically adjacent *superciliaris*, both sexes of *brodkorbi* differ in having the underparts pure white (as in *bilineata*), not washed with blue-grey and the dorsum of a more neutral, less bluish grey. Adult males and some females in very fresh plumage have a small white spot at the tip of the central rectrices (quickly wearing away); this spot is lacking in *superciliaris*. Adult females have the crown distinctly darker than the dorsum and slightly glossy, whereas in *superciliaris* the crown is dull grey, barely if at all darker than the dorsum in well-made specimens. There are no consistent measurement differences between *brodkorbi* and *superciliaris*, as far as I can determine. First year birds (with brownish primary coverts) appear to average smaller than adults, and both the rectrices and the primaries of these tiny birds are subject to severe wear, which substantially reduces the number of accurately measurable individuals in a series. There appears to be at least a tendency for higher tail:wing ratios in northern birds; few individuals of *superciliaris* reach or exceed .900 in this ratio, whereas most individuals of *brodkorbi* exceed this figure.

Range: from the Isthmus of Tehuantepec, Mexico, through the southern part of the Yucatan Peninsula, Belize, Guatemala, Honduras, and Nicaragua. Intergradation with *superciliaris* occurs in southwestern Nicaragua and northwestern Costa Rica. Two females (AMNH) from Los Sabalos, Nicaragua, on the San Juan River (which forms the border with Costa Rica) are intermediate, as are specimens from northern Guanacaste Province, Costa Rica. The influence of *brodkorbi* can be traced along the Pacific slope of Costa Rica as far as Orotina, about 20 km inland from the eastern shore of the Gulf of Nicoya (see map in Slud 1964), as manifested by paler underparts and less bluish upperparts than specimens from elsewhere in Costa Rica. Intergradation on the Atlantic slope must be more abrupt, as the darkest Costa Rica specimens seen are those from along the railway line ("Linea Vieja" of Slud's map) in Limon Province, northeastern Costa Rica.

Etymology: this subspecies is named for Pierce Brodkorb of the University of Florida, whose 1944 paper on *Polioptila albiloris* was one of the first to clarify the status of the 3 problematic Central American species of gnatcatcher.

Specimens examined: brodkorbi – MEXICO: Oaxaca, 24 miles north of Matias Romero, 1. BELIZE: Freetown, 2; Duck Run, 1. GUATEMALA: Chimoxan, 3; Finca Chama, 3; Secanquim, 2; Vera Paz, 1; unspecified, 2. HONDURAS: San Esteban, 2; Coyoles, 1; El Boqueron, 1; Monte Redondo, 1. NICARAGUA: Matagalpa, 2; Chinandega, 1; Chontales, 1; Leon, 1; Rio Grande, 1. *brodkorbi* X *superciliaris* – NICARAGUA: Los Sabalos, 2. COSTA RICA: El Zapotal, 6; Miravalles, 3; Bebedero, 2. *superciliaris* – COSTA RICA: Boruca, 9; El Hogar, 3; El Pozo de Terraba, 3; Buenos Aires, 2; Carillo, 2; Guacimo, 2; Guapiles, 2; Aquiares, 1; Limon, 1; Orotina, 1; Pozo Azul, 1; Tuis, 1; Volcan de Osa, 1. PANAMA: Almirante, 6; Paracote, east shore Montijo Bay, 3; Chiri qui, 3; Cerro Largo, Cape Mala Peninsula, 1; Cituro, 1; Darien, 1; El Villano, 1; Isla Coiba, 1; Santa Fe, 1; unspecified, 3. *bilineata* – COLOMBIA: Fundacion, 3; Gamarra, 2; Aguachica, 1; Bonda, 1. PERU: Cartavia, 1; La Laja, 1 (plus series of *bilineata* at A.M.N.H not listed).

References:

Brodkorb, P. 1944. The subspecies of the gnatcatcher *Polioptila albiloris*. *J. Washington Acad. Sci.* 34: 311–316.

Phillips, A. R. 1962. Notas sistematicas sobre aves maxicanas. II. *Anales Inst. Biol.* (*Univ. Mex.*) 33: 331–372.

Phillips, A. R., Speich, S., & Harrison, W. 1973. Black-capped Gnatcatcher, a new breeding bird for the United States; with a key to the North American species of *Polioptila*. *Auk* 90: 257–262.

Ridgway, R. 1904. The birds of North and Middle America, part 3. *Bull. U. S. Nat. Mus.* 50, part 3.

Slud, P. 1964. The birds of Costa Rica. *Bull. Am. Mus. Nat. Hist.* 128.
Wetmore, A. 1957. The birds of Isla Coiba, Panama. *Smithsonian Misc. Coll.* 134 (9).

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Apus pacificus in the Seychelles

by C. J. Feare

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Since 1972 swifts have been recorded in small numbers in the Seychelles and Amirantes. These have included several records of black swifts, presumed to be *Apus apus*, which species has been confirmed from specimens on Aldabra (Benson & Penny 1971, Frith 1974). There is also a record of *A. affinis*, one or two individuals having been seen in company with the indigenous *Collocalia elaphra* at Seychelles College, Mahe on 31 December 1972 (personal observations with D. E. B. Lloyd and J. High).

In addition, there have been 24 sightings of larger white-rumped swifts whose identity was obscure. From 1972 to 1976 I obtained descriptions of several individuals, sometimes seen in company with black swifts and in May 1978 I photographed two individuals on Bird Island, Seychelles. These photographs are deposited at the Museum of Zoology, Cambridge University.

All the birds were characterised by being largely dark with broad white rumps, pale chins and moderately forked tails. Two birds seen on Bird Island, Seychelles, in May 1978 at close range (c. 20 m with 8 x 30 binoculars) were black above but slightly paler below. These individuals were frequently seen in company with a Mascarene Martin *Phedina borbonica* and were estimated to be two-and-a-half to three times the size of this bird. When seen with black swifts they have appeared similar in size, larger, or slightly smaller (once). The extent of the pale chin was variable, ranging from an indistinct white chin patch, similar to some black swifts, to a larger more diffuse pale chin extending with mottling on to the upper breast. One individual had a white mark on the lower belly.

Behaviour was generally similar to black swifts, although on several occasions the wing beats of the white-rumped birds appeared noticeably slower and more laboured. The May 1978 birds, together with the *P. borbonica*, were notable in flying low over the beach and *Sterna fuscata* colony after 18.45 h when it was almost dark.

The photographs have been examined by C. W. Benson, R. K. Brooke and I. Sinclair. Brooke and Sinclair both commented that the birds were not an African species of swift. The photographs and descriptions do, however, fit the nominate race of *Apus pacificus*, the Pacific White-rumped Swift, an identification that I had tentatively proposed in 1972. Brooke and Sinclair had not seen *A. pacificus* alive and could not, therefore, confirm that the photographs were of this species, but Brooke (*in litt.* to Benson) commented that he was sure "from the evidence now available that *A. pacificus* is a regular but scarce visitor to the Seychelles". After examining skins, Benson agreed that the photographs and descriptions referred "in all probability" to nominate *A. pacificus*, and I am now confident that this is the correct identification.

A. p. pacificus is characterised by having a moderately forked tail, a broad white rump and being black apart from a pale chin and pale tips to feathers

on the ventral surface (Lack 1956). These pale tips are visible only at very close range, but the mottled upper breasts of some of the Seychelles birds and the white mark on the lower belly of one may have been due to these feather edgings. The two other races, *kanoi* and *leuconyx* can be excluded on account of their smaller size and narrow white rumps: *kanoi* is furthermore confined to southeastern Tibet (Dement'ev & Gladkov 1966), while *leuconyx* does occur, though unpredictably, in India (Ali & Ripley 1970).

A. p. pacificus breeds in eastern Asia and migrates, wintering in Malaysia, Indonesia and Australia (Dement'ev & Gladkov 1966). It also occurs as a winter migrant or wanderer in parts of eastern Bangladesh (Ali & Ripley 1970) and it has been recorded in the Phillipines, New Zealand and Macquarie Island (Rabor *et al.* 1970, Falla *et al.* 1966, Watson 1975). The 22 sightings in the Seychelles (10 on Bird Island, 11 on Frigate Island and 1 on Ilot Fregate) and 2 in the Amirantes, therefore represent a considerable western extension of the known range.

The seasonal distribution of records (6 in May, 4 in October and 14 in November) suggests that the Pacific White-rumped Swift is a passage migrant in the Seychelles and Amirantes. However, such a suggestion proposes an hitherto unknown wintering area for (?) small numbers of these swifts in Madagascar or Africa.

Frith (1974) reported sight records of the Mottled Spinetail *Telacanthura ussheri* on Aldabra in December 1972 and January 1973. Of the 22 Seychelles records of *A. pacificus*, 15 were in October and November 1972. Frith identified his birds on the basis of their white rumps and *square* tails, 2 of the birds also showing white vents. One of the Seychelles *A. pacificus* had a white mark on the lower belly (? = white vent), and these swifts could appear square-tailed when moulting their tail feathers. The highly migratory *A. pacificus*, since it occurs perhaps more regularly than so far recorded in the Seychelles and Amirantes, would be much more likely to reach Aldabra than the non-migratory *T. ussheri* of East Africa.

A further white-rumped swift was seen by A. Cheke (pers. comm.) on 28 June 1974 from a ship anchored off Agalega. He considered that this bird was *A. horus,* on account of the tail shape (incurved outer tail feathers: Cheke had noted this feature in Ethiopia) but commented (*in. litt.*) that Agalega was an unlikely place to find this species, which is a local resident and partial migrant in East Africa (Williams 1963). *A. pacificus* now seems a more likely alternative.

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References:

Ali, S. & Ripley, S. D. 1970. *Handbook of the Birds of India and Pakistan.* Vol. 4. Bombay: Natural History Society.

Benson, C. W. & Penny, M. J. 1971. The land birds of Aldabra. *Phil. Trans. Roy. Soc. Lond.* B. 260: 417–527.

Dement'ev, G. P. & Gladkov, N. A. 1966. *Birds of the Soviet Union,* Vol. 1. Jerusalem: Israel Program for Scientific Translations.

Falla, R. A., Sibson, R. B. & Turbott, E. G. 1966. *A Field Guide to the Birds of New Zealand.* London: Collins.

Frith, C. B. 1974. New observations of migrants and vagrants for Aldabra, Farquhar and Astove Atolls, Indian Ocean. *Bull. Brit. Orn. Cl.* 94: 12–19.

Lack, D. 1956. The species of *Apus*. *Ibis* 98: 34–62.
Rabor, D. S., Alcala, A. C. & Gonzales, R. B. 1970. A list of the land vertebrates of Negras Island, Philippines. *Silliman J.* 17: 297–316.
Watson, G. E. 1975. *Birds of the Antarctic and Subantarctic.* American Geophysical Union.
Williams, G. E. 1963. *A Field Guide to the Birds of East and Central Africa.* London: Collins.

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Remarks on specimens, holotype, description and subspecies of *Chlorophonia flavirostis* Schlater

by J. Ingels

Received 22 January 1979

The genus *Chlorophonia* consists of 4 species of small, sexually dimorphic tanagers. However, sexes should be alike, or nearly so, in the juvenal and first basic (sub-adult) plumages for all 4 species (Skutch 1954).

C. flavirostris, confined to the Colombian-Pacific region (Meyer de Schauensee, pers. comm.), was first described by Sclater (1861, 1886), but little has been published since (Gyldenstolpe 1941, Blake 1959, Hilty 1977). These notes based mainly upon the existing study material, add substantial information to the general knowledge of this tanager.

Specimens

I have been able to locate 19 mounted birds and study skins of *C. flavirostris*; 5 are housed in a private collection and 14 in public or scientific institutions. Exact collecting locality data are known for 6 skins only.

In the following list, for specimens collected in the wild, data, as far as available, are given in the following order: institution which cares for the skin, collection number, sex, author (if any) who first recorded the skin, locality and year of collection and the collector.

England: British Museum (Natural History) (BMNH), Tring: 1885.6.12.23, ♀ (?), holotype, described by Sclater (1861), collected in Ecuador. Sclater's guess that the type came from the eastern slope of the Andes is probably in error, since all specimens with locality data are from the western slope (Storer *in* Peters 1970); 1925.12.24.615, ♀, collected at Mindo, W. Ecuador, in January 1914 by W. Goodfellow.

Sweden: Naturhistoriska Riksmuseet, Stockholm (NHRS): 1919.08.20.3001, ♀, mentioned by Gyldenstolpe (1914), collected below Gualea, W. Ecuador, 20 August 1919 by L. Söderström.

United States: Chicago Natural History Museum (CNHM), Chicago: 251021, ♀, described as a subspecies *C. f. minima* by Blake (1959), collected near La Guayacana, Nariño, S. Colombia, 20 February 1958 by K. von Schneidern; Louisiana State University Museum of Zoology (LSUMZ), Baton Rouge: 60801, immature ♂, taken at Alto Yunda near La Cascada (Anchicaya Valley), Valle, S. Colombia, 11 June 1975 by S. L. Hilty; Academy of Natural Sciences, Philadelphia (PANS): 173498, ♀; 173499, ♂, both collected 27 May 1973 and 173500, immature ♂, collected 21 May 1973; all collected near the same locality as the LSUMZ specimen, by S. L. Hilty. The LSUMZ and PANS specimens have been recorded by the collector (Hilty 1977).

Denmark: an unsexed specimen acquired in 1909 by the Universitets Zoologisk Museum, Copenhagen, has disappeared from the museum's systematic collection (Fjeldså pers. comm.). R. W. Storer (pers. comm.) called my attention to this skin, which he saw when preparing the section on tanagers in Peters (1970).

The skins of 5 ♂♂, 1 ♀, 2 imm ♂♂ and 2 unsexed specimens, which had been imported alive into the United States and Denmark for zoological or private collections and which were preserved after death, are listed below. Data are given in the following order: country of importation, sex, previous zoological or private collection where the birds were exhibited alive and present owner of the skins.

Denmark: 3 ♂♂, and 1 imm ♂ and 1 ♀ (latter 2 both mounted), live birds originating from Ecuador, previously in the private collections of E. Nørgaard-Olesen and S. Carstensen; skins now under care of the former.

United States: 2 ♂♂, 1 imm ♂ and 2 unsexed specimens, all imported from Ecuador and added to the collections of the Boehm Aviaries, and the New York and Cleveland zoos, in the early 60's; skins are now in the American Museum of Natural History, New York: 781690, ♂; 648896, imm ♂; 701828 and 763838, both unsexed; 768814, ♂. Conway (1962) described 701828 when alive as a subspecies *C. f. boehmi*.

I believe all specimens now in existence are included in the lists mentioned, but I would appreciate hearing of any additional skins of *C. flavirostris*.

The holotype was described by Sclater (1861) as: "It appears to be the female of some undescribed species of this group" (he meant the genus *Chlorophonia*) and (1886) "The type specimen, which is at present unique, is probably a female". Recently, I examined this skin (BMNH 1885.6.12.23), and compared it with the sexed skins in Nørgaard-Olesen's private collection and the other BMNH and NHRS female skins. Without doubt, it is a ♂ in immature plumage and not a ♀. It has the upper breast bright grass-green, typical of immature males. Colour description of adult and immature males and females to support this statement, are given hereafter.

Colour descriptions

The following corroboratory colour descriptions of adult and immature males and females were made after examining the BMNH and NHRS skins and the live birds owned by Nørgaard-Olesen (prior to their first moult under captive conditions). Colours of soft parts were compared with the notes on the collector's label of all specimens taken in the wild.

Adult ♂♂: mainly bright grass-green; upper back crossed by a golden-yellow collar, broader in the centre; centre of breast and belly golden-yellow; golden-yellow under parts and grass-green upper breast separated by narrow chestnut band (narrower or broken in the middle so that only chestnut patches remain at each side of the breast); upper and under tail coverts golden-yellow; narrow eye-ring golden-yellow; wing and tail feathers black, edged with grass-green; under wing coverts and inner web of primaries white.

Eye white with a dark iris (Meyer de Schauensee's statement (1970) "iris white" is an error). Bill and feet bright orange to orange red; feet tend to be paler, more yellowish than bill, which usually is somewhat darker towards the tip of the upper mandible (cf. colour plate in Scamell 1969).

Adult ♀♀: grass-green not so bright as adult ♂♂, and with somewhat paler yellow under parts; wings and tail black edged with grass-green; centre of belly and vent pale yellow; yellow eye-ring not so prominent as in ♂♂. An ill-defined area on the chin faintly yellow; ♂♂ lack this yellowish chin. This area is not a "slight chin-*spot*" (Sclater 1886), that is to say it is not a well-defined area with a strikingly different colour compared to the surrounding area.

Eye, as ♂. Bill and feet somewhat paler than in ♂♂, rather pinkish yellow to orange (cf. colour plate in Sclater 1886). A colour plate of an adult pair of *C. flavirostris* has been published by Nørgaard-Olesen (1973).

Immature ♂♂: resemble adult ♀♀, except for the brighter grass-green upper breast and the greener chin. Eye-ring as adult ♂♂.

Immature ♀♀: have never been recorded or described, but could possibly resemble less brightly coloured adult ♀♀.

In live birds, the colour of bill, legs and feet is rather variable. It seems plausible that in the wild, a certain diversity in the colour of soft parts may occur, depending upon availability of colouring agents provided by natural food. Differences in the colours of soft parts between male and female have been reported (Everitt 1973), but are not uniform; individual variations within males and females may overlap variations between both sexes.

Subspecies

C. f. minima has been described by Blake (1959) from the skin of an adult

♀ (CNHM 251021) which was compared with the description of the holotype (Sclater 1861, 1886), then believed to be a ♀ (now known to be an immature ♂). The distinction between *minima* and the nominate form is based upon the differences in bill and feet colour, in wing and tail length and in chin colour. Blake (1959) used the notes on the label made by K. von Schneidern at the time of collection to describe the colour of bill and feet of *minima* as reddish brown and reddish yellow, respectively; and he wrote: "The reddish yellow feet have faded to dull yellowish in the skin" (Blake 1959). Sclater (1861) described the holotype without having seen the freshly collected skin and without any information from a collector's label. He described the feet as yellow and the bill as yellow, namely the colour these soft parts have at the present day in a faded skin, rather than the true colours in life.

Blake (1959) gives the following measurements for *minima*: wing 56 mm, tail 26 mm. I measured the 3 skins of ♀♀ in European collections, and I, found that wing and tail lengths of all 3 fall within the range: wing 54·5–56·5 mm, tail 23·5–25·5 mm. However wing and tail lengths of the 3 ♂♂ in Nørgaard-Olesen's collection fall within the following range: wing 55·8–57·2 mm, tail 26·4–28·0 mm. In view of this variability in wing and tail lengths of female (and male) skins, Blake's description "Similar to the nominate race . . . but decidedly smaller" (wherefore he named the subspecies *minima*) is disputable. It is more probable that in general females are slightly smaller than males.

The colour of the chin area is the strongest argument against differentiation into two subspecies. The holotype being an immature male, has no obvious pale yellowish chin. In referring to Sclater's description (1881), Blake (1959) used the expression "the small, bright yellow throat-spot", which is a misquotation of Sclater's description "slight chin-spot pale yellow", probably due to the fact that Blake did not see the holotype himself (he declares: "I have not seen this bird"—Blake 1959). However, Blake's description of the CNHM female skin, which he named *C. f. minima*, agrees completely with the NHRS and BMNH female skins. Blake (1959) did not, in fact, refer to the NHRS skin, although it had already been mentioned by Gyldenstolpe (1941). Since Blake (1959), *C. f. minima* has been used by Hilty (1977), though without justification, to identify specimens collected in the northern part of the species' distribution range in Colombia.

When, in 1962, Conway wrote a paper "After 101 years—a Yellow-billed Chlorophonia", he was obviously unaware of the existence of the NHRS, BMNH and CNHM skins. The 2 *C. flavirostris* described in Conway's paper were exhibited by the New York Zoological Society, and were 2 of the *C. flavirostris* imported from Ecuador by E. M. Boehm for the E. M. Boehm Aviaries. Unfortunately, Everitt (1973) transposed sexes when describing and comparing colour patterns of adult ♂ and ♀ in Boehm's own collection. Conway completes a description of one of Boehm's ♂♂ with the words: "It is barely possible that this bird is a new form (*C. f. boehmi*, of course! (*sic*)). It appears larger than our specimen" (he means, the ♂ in the New York Zoological Society's collection). Later, E. M. Boehm donated this particular ♂, together with a smaller one, to the Cleveland zoo and its skin was deposited in the American Museum of Natural History after death (AMNH 701828). Although this skin was labelled 'unsexed', it must be that larger male mentioned by Conway (1962). The new subspecies *boehmi* was evidently based

upon this one ♂ *C. flavirostris* with unusually large measurements: wing 62 mm, tail 33 mm (J. Bull, pers. comm.). However, no detailed description and measurements were given by Conway (1962) and there is no additional museum material to support the validity of this new subspecies.

No justification for subdividing of *C. flavirostris* can be found in the small individual variations within the very limited known material, and the number of skins collected for which exact locality data are given is too small to prove the existence of subspecific isolated populations. Although both 'subspecies' are mentioned by Storer (*in* Peters 1970), he does not subdivide the species. The details given above, support this view.

Acknowledgements: For their help and comments in preparing this paper, I am indebted to D. W. Snow and I. C. J. Galbraith (British Museum, Natural History, Tring), J. Fjeldså (Universitets Zoologisk Museum, Copenhagen), E. Nørgaard-Olesen (Janderup, Denmark), B.-O. Stolt (Naturhistoriska Riksmuseet, Stockholm), J. Bull (American Museum of Natural History, New York), W. G. Conway and J. Bell (New York Zoological Society, New York), S. L. Hilty (University of Arizona, Tucson), R. M. de Schauensee and Mrs. M. F. Trout (Academy of Natural Sciences, Philadelphia), R. W. Storer (University of Michigan, Ann Arbor), G. H. Lowery Jr. (Louisiana State University, Baton Rouge) and H.-G. Klös (Berlin, W. Germany).

References:

Blake, E. R. 1959. New and rare Colombian birds. *Lozania* (*Acta Zool. Colombiana*) 11: 1–10.
Conway, W. G. 1962. After 101 years – a Yellow-billed Chlorophonia. *Anim. Kingdom* 65: 60–61.
Everitt, C. 1973. *Birds of the E. M. Boehm Aviaries*. Trenton, New Jersey, U.S.A., E. M. Boehm, Inc.
Gyldenstolpe, N. 1941. On some new or rare birds. *Ark. Zool.* 33A (n°6): 17.
Hilty, S. L. 1977. *Chlorospingus flavovirens* rediscovered with notes on other Pacific Colombian and Cauca valley birds. *Auk* 94: 44–49.
Meyer de Schauensee, R. 1970. *A Guide to the Birds of South America*. Wynnewood, Pennsylvania: Livingston Publishing Co.
Nørgaard-Olesen, E. 1973. *Tanagers* (Vol. I). Skibby: Denmark.
Peters, J. L. 1970. *Checklist of Birds of the World*, Vol. XIII. Cambridge, Mass: Mus. Comp. Zoology.
Scamell, K. M. 1969. The Green-and-Yellow Chlorophonia *C. flavirostris*. *Avic. Mag.* 75: 1–2.
Sclater, P. L. 1861. *Proc. Zool. Soc. London*. 1861: 129.
Sclater, P. L. 1886. *Cat. Bds. Brit. Mus.* Fringilliformes, part II. 11: 56.
Skutch, A. F. 1954. Life Histories of Central American Birds. *Pacific Coast Avifauna* 31: 252–258.

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IN BRIEF

Alleged occurrence of *Rheinartia ocellata* in Sumatra

Dr. H. D. Rijksen conducted field work on the ecology of the orang utan *Pongo pygmaeus* in Sumatra from 1971 to 1974. His study area was in primary lowland rain forest at Ketambe, 32 km north of the township of Kutacane in Aceh Province at 3° 40′ N, 97° 30′ E, lying within the Gunung Leuser Reserve. While there he compiled a list of the birds and mammals present in his study area, which included the pheasant *Rheinartia ocellata* (Rijksen 1978). This species has not been recorded from Sumatra before.

In correspondence Dr. Rijksen wrote that he had "not found any hard evidence of the occurrence [of R. *ocellata*] but once glimpsed an animal which strongly resembled some plates in books depicting this species". He heard calls from this bird which were higher pitched than those of *Argusianus argus* but otherwise similar.

Males of the 2 pheasants *A. argus* and R. *ocellata* make dancing grounds, large cleared spaces used for display, from which they call loudly and repeatedly. The similarity of their calls has been emphasized, for instance by Robinson & Chasen (1936); but detailed descriptions of the calls of R. *ocellata*, which are actually quite distinctive, have only been published since Rijksen's field work (Wells 1975, Davison 1978).

I visited Ketambe from 18 to 21 August 1978, when male *A. argus* were calling continually. In this period I covered the entire $1 \cdot 5$ km^2 area used by Rijksen (at an altitude from 350 to 500 m) as well as a further large area to the south extending to 1020 m altitude. Four dancing grounds between 350 and 500 m—the total in use within Rijksen's area—and a fifth at 600 m were examined. Feathers were found on each which belonged to male *A. argus*, and all the calls heard from the dancing grounds were of that species. Birds at a further 8 distant dancing grounds, on both sides of the Alas valley, were identified from calls alone as *A. argus*. None of the distinctive calls of R. *ocellata* were heard.

It would seem that Rijksen's bird was misidentified due to the inadequacy of published descriptions of the calls of R. *ocellata*, and this species should therefore not be added to the Sumatran list.

Acknowledgements: I am indebted to Dinas PPA, Aceh Tenggara, for permission to visit the Gunung Leuser Reserve, and to Drs. C. L. and E. Schurrman for their hospitality there.

References:
Davison, G. W. H. 1978. Studies of the Crested Argus, II. Gunung Rabong 1976. *World Pheasant Association Journal* III: 46–53.
Rijksen, H. D. 1978. A field study on Sumatran Orang Utans (*Pongo pygmaeus abelii* Lesson 1827). Mededelingen Landbouwhogeschool Wageningen. Veenman: Wageningen.
Robinson, H. C. & Chasen, F. N. 1936. *Birds of the Malay Peninsula*, Vol. III. Witherby: London.
Wells, D. R. 1975. Bird Report 1972 and 1973. *Malay. Nat. J.* 28: 186–213.

4 January 1979 G. W. H. Davison

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Two overlooked vagrants from the Tristan da Cunha group

The most recent list of the birds of the Tristan da Cunha group is that of Elliott (1957). He does not mention either the Ringed Plover *Charadrius hiaticula* of the Holarctic or the Dark-billed Cuckoo *Coccyzus melacoryphus* of the Neotropical as vagrants collected there. *C. melacoryphus* is mentioned without comment by Winterbottom (1976) in his report on the Keytel collection. Peringuey (1910: 5), who was Director of the South African Museum, Cape Town, adverts to the Keytel collection and states "there was also procured a South American Cuckoo, that had found its way to Nightingale Island". Peringuey (1924: 8) describes an exhibit of Tristan birds that he had caused to be displayed. He notes with pleasure that the museum has two species not recorded by Wilkins (1923) "1, a South American Cuckoo (*Coccyzus melanocoryphus*) and 2, the Ringed Plover (*Aegialitis hyaticola*), accidental importations no doubt".

The 1924 reference to a cuckoo should be read with the 1910 reference, i.e. Keytel obtained a *Coccyzus melocoryphus* on Nightingale Island during his period in the group, which Peringuey (1910) and Winterbottom (1976) give as 1907–1909. This is not the first record of vagrancy by *C. melacoryphus* : it

has also reached the Falkland Islands (Bennett 1937, not 1938 as in Meyer de Schauensee 1966: 137) and it even breeds in the Galapagos Islands. Neither Peringuey (1910) nor Winterbottom (1976) mention *Charadrius hiaticula* in connection with Keytel and his work and we may assume that it was not obtained by him but by someone else a little later in the century.

The record of *Coccyzus melacoryphus* is further support for Rand's (1955) thesis that it is only from the Americas that land birds can be expected to reach the Tristan group. How the seashore frequenting *Charadrius hiaticula* reached the group is uncertain since it is only a vagrant in the Americas south of the Arctic Circle (Meyer de Schauensee 1966).

References:

Bennett, A. G. 1937. *Coccyzus melanocoryphus* in the Falkland Islands. *Ibis* Ser. 14(1): 868.
Elliott, H. F. I. 1957. A contribution to the ornithology of the Tristan da Cunha group. *Ibis* 99: 545-586.
Meyer de Schauensee, R. 1966. *The Species of Birds of South America and their Distribution.* Livingston Publ., Narberth (U.S.A.).
Peringuey, L. 1910. *in* 'Report of the South African Museum for the year ended 31st December, 1909'. Cape Times, Cape Town, for Govt Printer: G.8-1910.
Peringuey, L. 1924. *in* 'Report of the South African Museum for the year ended 31st December, 1923'. Cape Times, Cape Town, for Govt Printer, Pretoria.
Rand, A. L. 1955. The origin of the land birds of Tristan da Cunha. *Fieldiana Zool.* 37: 139–166.
Wilkins, G. H. 1923. Report on the birds collected during the voyage of the 'Quest' (Shackleton-Rowett Expedition) to the southern Atlantic. *Ibis* Ser. 11(5): 474–511.
Winterbottom, J. M. 1976. Keytel's birds from Tristan da Cunha. *Ostrich* 47: 69–70.

22 December 1978 R. K. Brooke

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The Atlas of Australian Birds: an appeal for data from museum collections

Australia has embarked upon the production of a bird Atlas, organised by the Royal Australasian Ornithologists' Union and funded by Commonwealth Government grants. This scheme, unlike its British counterpart, aims to determine both the breeding and non-breeding distribution of all Australian birds. The Atlas has been divided into 2 parts: the Field Atlas which records bird distributions for the five years from 1977 until 1981, and the Historical Atlas which aims at recording distributions prior to 1977. Data for the Historical Atlas comes from 3 sources—field notebooks, museum specimens and literature.

Work has already begun on extracting records from these 3 sources, but many early Australian skin and egg collections were taken out of the country and lodged in museums and private collections overseas. We are aware of the Australian specimens in the British, the Royal Scottish and the Cambridge University Museums but feel sure that there are other collections which would be of great value to the Atlas if the information was made available. Preferably, specimens should be labelled and include such details as the date and locality.

Any information on the whereabouts of such collections should be sent (by the end of July if possible) to: Penny Paton, c/o Mr. D. C. Paton, Dept. Ecol. & Evol. Biology, School of Biological Sciences, University of California, Irvine, California 92717 U.S.A.

28 March 1979

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Scientific nomenclature and the style and lay-out of papers and of References should conform with usage in this or recent issues of the *Bulletin*, unless a departure is explained and justified. Photographic illustrations, although welcome, can only be accepted if the contributor is willing to pay for their reproduction.

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Correspondence about Club meetings and other matters not mentioned above should go to the Hon. Secretary, R. E. F. Peal, 2 Chestnut Lane, Sevenoaks, Kent TN13 3AR.

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Dr. J. F. MONK

Volume 99 No. 3 September 1979

FORTHCOMING MEETINGS

Tuesday 20 November 1979 at 6.30 p.m. for 7 p.m. at the Senior Common Room, South Side, Imperial College, Prince's Gardens, S.W.7, Mr. M. E. J. Gore (who is currently writing a checklist on the avifauna of The Gambia for the B.O.U.) on *Birds of The Gambia*. Those wishing to attend should send a cheque for £4.30 per person with their acceptance on the enclosed slip to the Hon. Secretary at 2 Chestnut Lane, Sevenoaks, Kent TN13 3AR to arrive not later than first post on Thursday, 15 November.

Tuesday 15 January 1980. This will be the first meeting of the year in which the centennial volume of the *Bulletin* will be published. In view of the pioneer studies of the Club on migration, the Reports on which filled nine volumes of the *Bulletin*, it is appropriate that Dr. C. J. Bibby will speak on *Ecological aspects of Migration*, at the same time and place as on November (see above). Those wishing to attend should send a cheque for £4.30 per person with their acceptance on the enclosed slip to the Hon. Secretary at 2 Chestnut Lane, Sevenoaks, Kent TN13 3AR to arrive not later than first post on Thursday, 10 January 1980.

March/April 1980. To be arranged.

May 1980. Dr. L. H. Brown will be the speaker.

Please inform the Hon. Secretary (telephone 0732 50313) without delay if you accept and are subsequently unable to attend.

GIFTS OR OFFERS FOR SALE OF UNWANTED BACK NUMBERS OF THE *BULLETIN* ARE VERY WELCOME

Bulletin of the BRITISH ORNITHOLOGISTS' CLUB

Vol. 99 No. 3 Published: 20 September 1979

The seven hundred and twentieth Meeting of the Club was held in the Senior Common Room, South Side, Imperial College, London, S.W.7 on Tuesday, 15 May 1979 at 7 p.m. Total attendance was 21 Members and 7 guests.

Members present were: P. HOGG (*Chairman*), Miss I. P. BARCLAY-SMITH, J. P. C. BURGESS, D. R. CALDER, R. D. CHANCELLOR, R. A. N. CROUCHER, O. J. H. DAVIES, D. J. FISHER, DR. C. H. FRY, A. GIBBS, B. GRAY, D. GRIFFIN, C. F. MANN, REV. G. K. McCULLOCH, DR. J. F. MONK, J. G. PARKER, R. E. F. PEAL, DR. D. W. SNOW, P. D. W. TIMMS, C. E. WHEELER, BARON CHARLES DE WORMS.

Guests present were: Dr. B. Stonehouse (speaker), Miss M. Barry, Mrs. G. K. McCulloch, G. P. McCulloch, Capt. I. E. McCulloch, J. Messenger, Mrs. B. K. Snow.

Dr. B. Stonehouse spoke on Penguins and Flightlessness in Birds. He dealt first with the evolution of penguins, deducing that the earliest forms must have been small, although no fossil remains of them have yet been discovered. He explained that they evolved as temperate water birds and that now most species are to be found in the zone 40°S–60°S, seeking cold water areas and approximately the same water temperature all the year round. He showed slides, including one of the wing loadings of various groups of sea-birds. He dealt with the effect of wing loading upon the ability of a bird to fly and the nature of its flight and this gave rise to considerable discussion of particular interest, covering many sea birds.

The seven hundred and twenty first Meeting of the Club was held at the Goat Tavern, 3 Stafford Street, London W.1., on Tuesday, 10 July 1979 at 7 p.m. Total attendance was 20 members and 3 guests.

Members present were: P. HOGG (*Chairman*), W. G. HARVEY (speaker), MISS PHYLLIS BARCLAY-SMITH, MRS. DIANA BRADLEY, D. R. CALDER, R. D. CHANCELLOR, the EARL OF CRANBROOK, R. A. N. CROUCHER, SIR HUGH ELLIOTT, D. J. FISHER, A. GIBBS, B. GRAY, D. GRIFFIN, J. A. HANCOCK, C. F. MANN, J. G. PARKER, R. E. F. PEAL, P. S. REDMAN, K. V. THOMPSON and C. E. WHEELER.

Guests present were: Miss M. Barry, Mr. and Mrs. Christopher Scarlett.

Mr. W. G. Harvey gave an illustrated address on Ornithology and Conservation in Indonesia. He gave much information about the relationship between the species found in Indonesia and those in adjacent areas and on ornithological work carried out in Indonesia. He pointed out that there was little known about the bird populations currently in forest areas and that investigation of the remaining forests, particularly in Java, was much needed. Indonesia had about 340 endemic bird species outside New Guinea (in which there were about 470 endemic species) and the density of birds was low in the most populated areas, so he feared that a number of species must be in danger of extinction.

Variations in the external features of the Spur-winged Goose

by A. Clark

Received 26 January 1979

The Spur-winged Goose *Plectropterus gambensis* is accepted by most authorities as a member of the tribe of perching ducks Cairinini, alongside two other African species, the Pygmy Goose *Nettapus auritus* and the Knob-billed (or Comb) Duck *Sarkidiornis melanotos*. Woolfenden (1961), on the other hand,

found many features characteristic of Shelduck (Tadornini) in its post-cranial skeleton and considered it an aberrant Shelduck. It is not as aquatic as the Shelduck and the polygamous nature of the males resembles that of the Knob-billed Duck. Reviewing the known characteristics of the two tribes, Delacour (1954/64) retains it in the Cairinini, but as a rather aberrant member. It is the largest and most wary of African waterfowl and the sole representative of its genus in the world.

The Spur-winged Goose is distributed throughout Africa from the Sahara to the Cape but is absent from the drier parts of the Cape Province, South West Africa (Namibia) and Botswana. Stark & Sclater (1906) seldom met with it south of the Orange River and today its principal stronghold in the Republic of South Africa (RSA) is in the Vaal basin where the population probably exceeds 10,000. It is not uncommon in other parts of the RSA where suitable watery habitat is available.

Stark & Sclater (1906) accepted two species *Plectropterus gambensis* and *P. niger* but considered the differences could be merely subspecific. Delacour (1954/64) treated them as two races, the Gambian Spur-winged Goose *P. g. gambensis* and the Black Spur-winged Goose *P. g. niger*, the former distributed between the Sahara and the Zambezi and the latter between the Zambezi and the Cape, but recognised many intermediates. According to Delacour *niger* has a less conspicuous knob on the head, reduced bare patches on the face and less white on the face, neck, breast and wings than *gambensis*. Clancey (1967), also accepted two races, but considered the distinctive characteristics to have developed in isolation and that the two races, now in secondary contact, were producing many intermediates. North of the Zambezi, in Malawi, Laycock (1965) recorded one of the darker form, while a specimen from Ethiopia (Abyssinia) in the British Museum, collected in 1905, although labelled *P. g. gambensis*, shows characteristics of the southern form.

Benson *et al.* (1970), McLachlan & Liversidge (1970) and Prozesky (1970) treat the species as monotypic, apparently agreeing with Smithers & Mackenzie (1973) that it is not possible to separate the species into two races. Mackworth-Praed & Grant (1962) likewise recognise no races.

In an attempt to throw some light on these differences specimens were examined at the British Museum, Tring (38 *P. g. gambensis* and 6 *P. g. niger*), Wildfowl Trust, Slimbridge (2 *P. g. gambensis* and 2 *P. g. niger*) and the Transvaal Museum (4 *P. g. gambensis* and 4 *P. g. niger*).

The size of the knob was found to be variable in both races, but in most *niger* females the knob was either absent or less pronounced. The extent of the bare area on the face, which evidently extends with age, was variable and this applied to both sexes of either race. In what appeared to be specimens of old birds the bare area covered the knob, surrounded the eye and covered part of the cheek. Nine of 31 adult *gambensis* of both sexes and 3 of 4 *niger* specimens had small wattles on the top of the head, a feature which evidently occurs throughout the range. The extent of the white feathers on the face was variable, specimens collected 70 years ago in most African countries showed its extent to vary from nothing to full face (when the white feathers extend to the chin and throat), and more recent specimens showed no difference. Even so, most specimens of *niger* showed less white on the face than

gambensis and this appeared to be true also for the underparts. Live birds from Nigeria present in the Slimbridge collection during 1978 when compared with most wild birds seen on the Witwatersrand at this time confirmed these differences.

There were 2 male specimens at the British Museum (1 Ethiopian and 1 Zambian) and 3 males at the Transvaal Museum, (2 from the Zambezi and one collected near Rustenburg, Transvaal in 1938), which had a bare patch at the top of either side of the neck (which in live birds appears red or orange). The Nigerian male in the Slimbridge collection had this distinctive feature. Most published illustrations (Delacour 1954/64, Scott 1961) show the bare red neck patch on the male of the northern form only and Marler (1973) states that it does not occur in *niger*. However, it can often be seen in male birds amongst wild flocks on the Witwatersrand and it can be seen in birds at Ndumu, Zululand (M. D. Olver, pers. comm.). Clancey (1967) found it present in southern African birds (presumably for Natal) and Smithers & Mackenzie (1973) show it as occurring in Rhodesian birds. Evidently it can be found in male birds throughout the range.

Extremes of variability in all these distinctive features were found in both northern and southern forms. Seventy years ago Horsburgh (1912), who accepted two species, found birds in the Orange Free State and the Transvaal answering to the description of the northern species *P. gambensis*, although he does not mention the bare red neck patch, and this appears to be true today.

Although there are no unsurmountable geographical barriers between the various African regions for a strong flier like the Spur-winged Goose (ringing of RSA birds has provided no evidence of regular seasonal movements but occasional flights in excess of 600 km have been recorded) it is possible that the West African birds form a fairly discrete population, and this could be true also of the Ethiopian population. Museum specimens are admittedly inadequate for a critical assessment of the variables involved due to deterioration of the plumage, the apparent inaccuracy of some sex determinations and the inability to adjust for the effect of age on some features. Nevertheless, it is clear from this survey that the level of individual variation in many populations is such that no satisfactory arrangement of the species into northern and southern forms can now be effected. The two types were in all probability segregated from one another in former times, but with the disappearance of the cause or causes of isolation, intermixing has taken place and the variable population we now encounter has resulted. In the circumstances I do not believe that the *P. gambensis* warrants treatment as a polytypic species.

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References:

Benson, C. W., Brooke, R. K., Dowsett, R. J. & Irwin, M. P. Stuart. 1970. *The Birds of Zambia*. London: Collins.
Clancey, P. A. 1967. *Game Birds of Southern Africa*. Cape Town: Purnell.
Delacour, J. 1954/64. *The Waterfowl of the World*. 4 vols. London: Country Life.
Horsburgh, Boyd R. 1912. *Game Birds and Waterfowl of South Africa*. London: Witherby.
Laycock, H. T. 1965. Aquatic birds of Blantyre. *Ostrich* 36: 127.

Mackworth-Praed, C. W. & Grant, C. H. B. 1962. *Birds of the Southern Third of Africa.* London: Longmans Green.
Marler, C. 1973. Breeding of the Black Spur-winged Goose and the Black Brant at Flamingo Gardens, Olney. *Int. Zoo. Year Book* 13.
McLachlan, G. R. & Liversidge, R. 1970. *Robert's Birds of South Africa.* Cape Town: Central News Agency Ltd.
Pitman, C. R. S. 1963. The nesting and some other habits of *Alopochen, Nettapus, Plectropterus* and *Sarkidiornis*. Wildfowl Trust, 16th Annual Report.
Prozesky, O. P. M. 1970. *A Field Guide to the Birds of Southern Africa.* London: Collins.
Scott, P. 1961. *A Key to the Wildfowl of the World.* London: Country Life.
Smithers, R. H. N. & Mackenzie, M. J. S. 1973. *Guide to the Waterfowl of Rhodesia.* Trustees: National Museum and Monuments of Rhodesia.
Stark, A. C. & Sclater, W. L. 1906. *The Fauna of South Africa. Birds*, 4. London: Porter.
Woolfenden, G. E. 1961. Post cranial osteology of the Waterfowl. *Bull. Florida State Mus. Biol. Sci.* 6(1): 1–129.

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The *Bradypterus cinnamomeus-mariae* complex in Central Africa

by R. J. Dowsett & R. Stjernstedt

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The status of *Bradypterus cinnamomeus ufipae*

Since Grant & Mackworth-Praed (1941) described *Bradypterus cinnamomeus ufipae* from Mbisi, Sumbawanga, on the Ufipa Plateau in southwestern Tanzania, all workers have attributed this form to the species *B. cinnamomeus*. Grant & Mackworth-Praed considered *ufipae* to be confined to the Ufipa Plateau; they record that the type (obtained by R. E. Moreau's collector) was from an altitude of 2440 m, although in fact Mbisi Forest is at about 2250 m. White (1960) considered *ufipae* to be a poorly differentiated form, best treated as synonymous with *B. c. nyassae*. Benson *et al.* (1971) ascribe to *B. cinnamomeus* a wide distribution in northern Zambia, in both montane and non-montane areas. They attribute all Zambian material to the race *nyassae*, but point out that birds from non-montane areas of the Northern and Luapula Provinces are rather redder, implying an approach to *ufipae*. Hall & Moreau (1970) draw attention to these Central African populations (Map 179), but consider them "duller and more olive" than populations of *B. cinnamomeus* from elsewhere.

During the past few years we have studied the morphology, vocalisations and distribution of various populations of *Bradypterus* in Central Africa. We are convinced that all workers have been in error in ascribing *ufipae* to *B. cinnamomeus,* as it is clearly a form of *B. mariae* (or *B. barratti, sensu lato*). The *Bradypterus* which occurs in the non-montane forests of northern Zambia, mostly between 1200 and 1600 m altitude, is the species *mariae* and not *cinnamomeus*.

White (1960) appears to have confused these two species in the hand, as did Grant & Mackworth-Praed (1941) and other workers; we suspect that when he considered *ufipae* to be close to *B. cinnamomeus nyassae,* he cannot have had specimens of *nyassae* for a direct comparison.

The songs of the two species have also been confused, for Benson (1956) considered the song-call of northern Zambian birds (which he and Moreau then attributed to *ufipae*) to be similar to that of *B. c. nyassae,* which Benson (1940) had in fact distinguished from the voice of *B. mariae* (as *B. usambarae*) in Malawi. Benson (*in litt.*) feels that this error may have been due to deterioration in his hearing, and by 1964 he could not hear the song of either species at all.

The morphology, voice and ecological distribution of these two *Bradypterus* species in Central Africa are discussed below. For the purpose of the present study we find it convenient to consider *B. mariae* and the Cameroun-East Congo *B. lopezi* species separate from *B. barratti* of southern Africa, of which we have no personal experience. Both White (1960) and Hall & Moreau (1970) treated all 3 forms as members of a single species, *B. barratti.* Benson (1946) felt that the voice of *barratti* in eastern Rhodesia was indistinguishable from that of *B. mariae usambarae* and *granti* of Malawi, but his description of *barratti's* voice differs in several respects from our own experience of that of *usambarae*. Moreover, Oatley (1969: 178) implies that *B. barratti* of Natal (in comparison to *B. cinnamomeus*=*mariae* of northwestern Zambia) does not duet. Clearly, anyone in a position to tape-record the voice of *barratti* should compare it sonographically with the songs of the *mariae* populations discussed in the present paper.

Morphological differences between *Bradypterus mariae* and *cinnamomeus*

In 1971, during a visit to the Ufipa Plateau, Dowsett was impressed by the morphological similarity of topotypical *ufipae* in Mbisi Forest to *B. mariae usambarae* of the montane forest interior of the Nyika Plateau. Both are distinct from *B. c. nyassae* of the Nyika in having the colour of the upperparts dark and saturated, and a relatively short tail with narrow rectrices. Dowsett found *ufipae* frequently on the edge of forest (a niche usually occupied by *B. cinnamomeus*) as well as inside, but this is not surprising as much of the canopy of Mbisi Forest is broken up by emergents such as *Euphorbia* sp., and the dark under-storey usually favoured by *mariae* is generally lacking. As far as we could determine, *ufipae* is the only form of *Bradypterus* at Mbisi. Elsewhere in southwestern Tanzania, Zambia and Malawi we have found two species sympatrically in several localities: *B. mariae* in the interior and *B. cinnamomeus* in bracken-briar on the edge of forest.

When Dowsett visited the Marungu highlands of southeastern Zaire in 1972 (Dowsett & Prigogine 1974) he found 2 forms of *Bradypterus*:— *ufipae* inside narrow riparian forest and *cinnamomeus* in bracken-briar on the forest edge. Specimens of both were collected, and these were compared to series gathered from the collections of the British Museum (Natural History), American Museum of Natural History, Livingstone Museum (Zambia), Musée Royal de l'Afrique Centrale (Tervuren) and National Museums of Rhodesia. The results of comparisons made independently by C. W. Benson, Mrs. R. T. Chapin and Dr. A. Prigogine are discussed by Dowsett & Prigogine (1974). These comparisons, which included the types of *ufipae* and *nyassae,* showed clearly that the Marungu specimens were of these 2 forms. Consequently, *ufipae* cannot be considered conspecific with *B. cinnamomeus,*

as they occur on Marungu within sight and sound of each other. We therefore concluded that *ufipae* is correctly placed in the species *mariae* or *barratti*.

In colour *B. cinnamomeus nyassae* differs consistently from the races of *B. mariae* in being paler on the upperparts, more reddish and less chocolate in tone. Below, *nyassae* is less richly coloured than *B. m. granti* of southern Malawi, the throat always white without any rufous wash, and the white on the belly better developed. By comparison, *nyassae* and *ufipae* are more similar below. The rectrices of *nyassae* are wider than those of *mariae,* the central pair when fresh being about 15 mm wide at one-third of their length from the apex, as against 10 mm.

It is clear from the measurements of these two *Bradypterus* species that there is no consistent size difference between the sexes, although the largest individuals are usually males. For this reason measurements of both sexes and of unsexed specimens are combined in Table 1. C. W. Benson and M. P. S. Irwin (*in litt.*) kindly supplied the wing and tail lengths, taken by them from museum specimens on our behalf. The weights were all taken by Dowsett from birds collected or caught for ringing.

TABLE 1

Weights and measurements of *Bradypterus cinnamomeus* and *B. mariae* in Central Africa

	Weights (g)	Wing (mm)	Tail (mm)	Tail/Wing
B. cinnamomeus nyassae	16.3–22.0	58–67	68–83	1.11–1.31
(Localities from Nguru Mts,	*mean:* 18.5	61.8	73.8	1.18
Tanzania, south to Mulanje Mt,	*n*=20	29	21	21
Malawi; Marungu, Zaire).				
B. mariae ufipae	17.0–24.0	62–72	63–74	0.97–1.11
(Ufipa, Tanzania; Marungu,	*mean:* 20.2	66.8	69.7	1.04
Zaire; northeast and northwest	*n*=17	34	28	28
Zambia).				
B. mariae granti & usambarae	12.0–19.9	59–67	55–67	0.90–1.06
(Mt Rungwe, Tanzania south to	*mean:* 16.9	62.0	62.1	1.00
Mulanje Mt, Malawi).	*n*=29	51	34	34

The ratio of tail to wing length is considered to be of specific importance, and the figures for *B. cinnamomeus nyassae,* which has a relatively long tail, barely overlap with those for the races of *B. mariae*.

B. m. ufipae is larger than the other races of this species studied here, in wing and tail measurements, and it even averages heavier than *B. c. nyassae*. However, *ufipae* does have the relatively short tail typical of *B. mariae,* although it shows some approach to *B. c. nyassae* in this character.

Our data, although admittedly limited, do not suggest any increase in size differences between *B. cinnamomeus* and *B. mariae* where they are sympatric geographically (e.g. Nyika, Rungwe and Marungu). As these two species are almost invariably segregated ecologically where they do occur together, there is unlikely to be any direct competition between them.

SPECIFIC DIFFERENCES IN VOCALISATIONS

Independently of studies of the morphological relationship of *ufipae,* important differences in the vocalisations of some Central African populations of *Bradypterus* were noticed by Stjernstedt. In particular, he noted that the voice of the supposed *B. cinnamomeus* in the non-montane forests of

northeastern Zambia was apparently identical to that of montane *B. mariae* of the southern highlands of Tanzania and of *ufipae* in the Mbisi Forest. These Zambian birds responded actively to playbacks of the recorded song of *mariae* from southwestern Tanzania.

B. c. nyassae of southwestern Tanzania has a song very different from that of *B. mariae,* with which it is locally sympatric, and tape recordings of *nyassae* produced no response from the birds tested in northeastern Zambia at Mbala. At first Stjernstedt thought that the song of *B. cinnamomeus* must diverge where the species occurs sympatrically with *B. mariae,* but this is

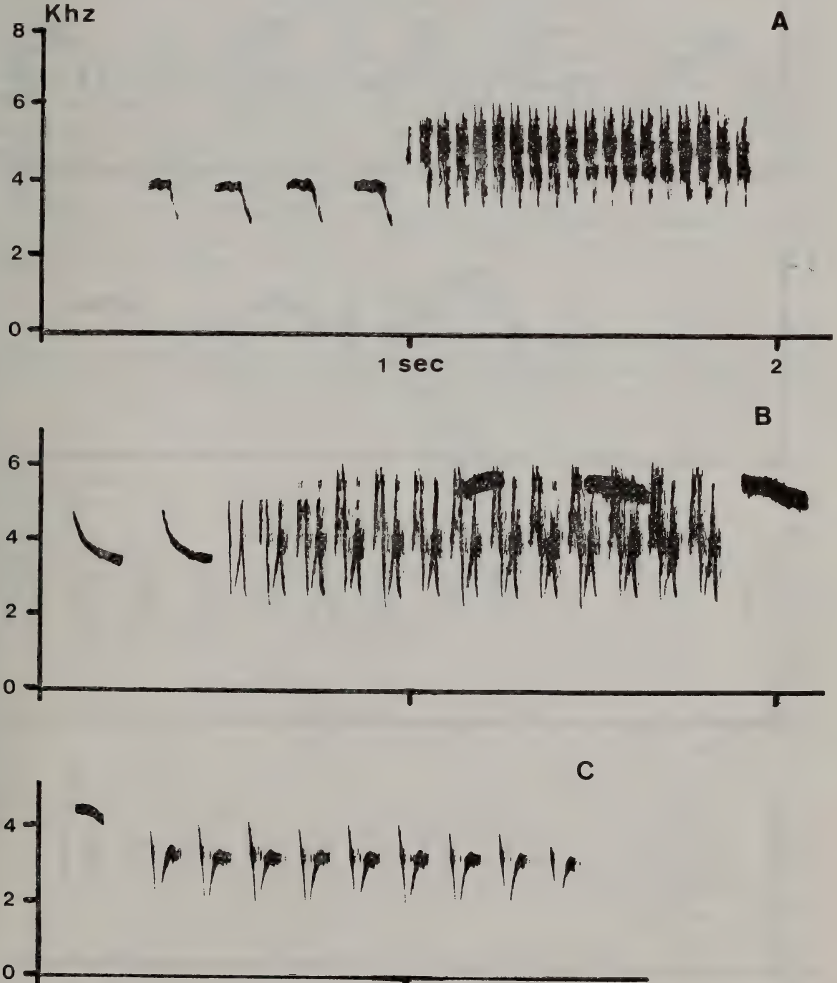

Fig. 1. Sonograms illustrating songs of: A, *Bradypterus cinnamomeus nyassae,* Mbeya (southwest Tanzania); B, *B. c. nyassae,* Ilembo (southwest Tanzania); C, *B. c. cinnamomeus,* Irangi Forest (Kenya). 1A, 1B from tapes by Stjernstedt, 1C from Keith (1971).

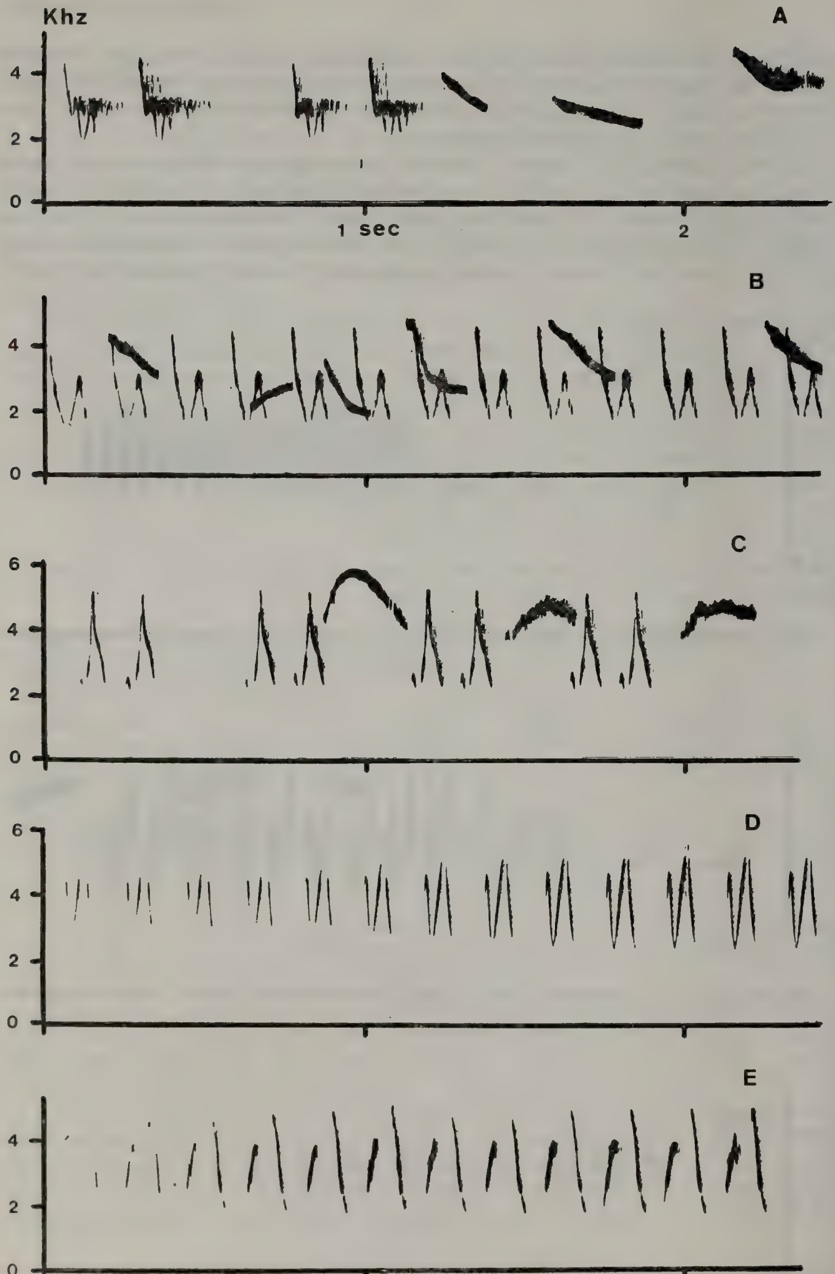

Fig. 2. Songrams illustrating songs of: A, *Bradypterus mariae ufipae,* Mbisi Forest (southwest Tanzania); B, *B. m. ufipae,* Mbala (northwest Zambia); C, *B. m. usambarae,* Tukuyu (Southwest Tanzania); D, *B. m. usambarae,* Ilembo (southwest Tanzania); E, *B. lopezi camerunensis,* Mt Cameroun. All from tapes by Stjernstedt.

clearly not the case, for in playback experiments the Mbala population did react to the song of *mariae*.

The song of *B. cinnamomeus* (Fig. 1) is typically a rattle of 10-20 beats per second, lasting about one second and preceded by 2-5 "seep – seep – seep" notes. A second bird sometimes accompanies in duet with three or four high pitched notes of even pitch.

The song of *B. mariae* (Fig. 2) differs from that of *B. cinnamomeus* in the following respects: no initial "seep" notes; delivery of notes varying in tempo from 2 to 6 beats per second, sometimes grouped in twos (e.g. Fig. 2A, 2C); notes are delivered crescendo; if a second bird accompanies in duet (Fig. 2A, 2B, 2C) it gives arhythmic phrases of variable pitch.

Fig. 1C shows a sample of the song of nominate *B. cinnamomeus* from Kenya (from Keith 1971). Here the tempo is rather slower, resembling the song of *B. mariae* in this respect, but there is no crescendo and it is preceded by the diagnostic "seep". Fig. 2E depicts the voice of *B. lopezi* from Mt Cameroun, considered by some authorities to be specifically distinct from *mariae* and *barratti*. We have not examined specimens of this form, but the song can be seen to be typical of *mariae*.

To sum up, the vocalisations of *B. mariae ufipae*, the other forms of *mariae* and of *B. cinnamomeus* suggest a similar picture to that presented by our studies of morphology and ecology.

The distribution of *B. cinnamomeus* and *B. mariae* in Central Africa

Because Hall & Moreau (1970) followed White (1960) and others, their Maps 179 and 180 are mainly – though not entirely – incorrect as regards the

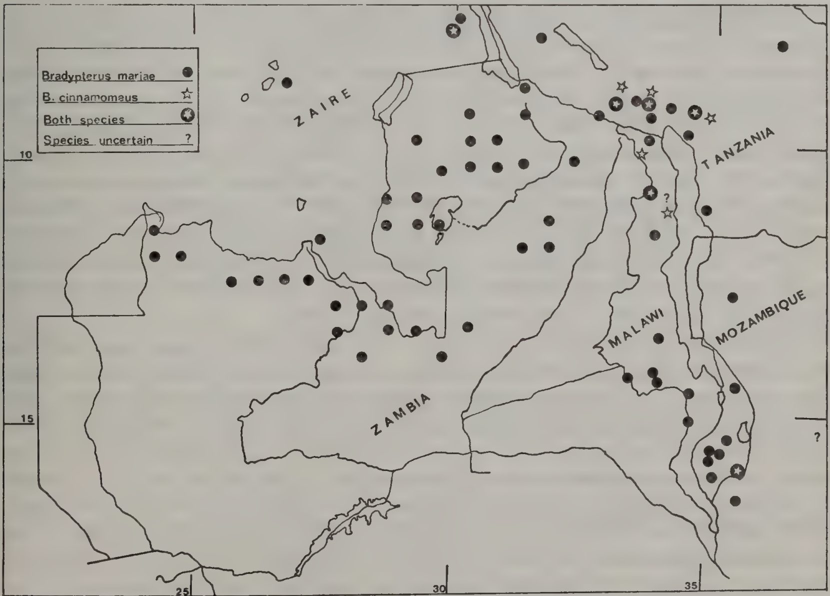

Fig. 3. The Central African distribution of *Bradypterus cinnamomeus* and *B. mariae*. Zambian records plotted by ¼° square (from *An Atlas of the Birds of Zambia*, Dowsett in prep.).

Central African distribution of these two *Bradypterus* species. In Fig. 3 we show their correct distributions in this area, based on our field observations and the re-assessment of specimens described in this paper.

Doubt attaches to the identity of *Bradypterus* warblers noted at 2 localities (shown as ? in Fig. 3). Benson & Benson (1977) refer to *B. cinnamomeus* as "probable also on Uzumara" (a satelite mountain of the North Vipya, in sight of the Nyika), but Benson (*in litt.*) did not collect a specimen, nor can he trace any sound record. According to Chapman & White (1970: 132), Uzumara reaches only to 1920 m altitude. At Namuli in Mozambique, Vincent (1935: 511) saw and heard *Bradypterus* which he considered similar to those he collected on Mulanje. Both Vincent's specimens are in the British Museum at Tring, and are *B. mariae* (Benson *in litt.*). Although there is no specimen from Namuli, it is likely that *B. mariae* occurs there.

However, *B. cinnamomeus* does also occur on Mulanje, which is the type locality of the race *nyassae*. Benson has kindly re-examined the type specimen for us, and confirms that it is indeed a form of *cinnamomeus*. The status of this species on Mulanje is not clear, and White (1960: 408) remarked that it was known from there only by the type. Belcher (1925: 810) referred a C/2 collected on Mulanje to *cinnamomeus*, although his comparison of the voice of birds heard "in the wood" to that of the *Bradypterus* (*mariae*) of Zomba and Chiradzulu, suggests that he also encountered *mariae* there. The field observations of Penry & Talbot (1975) suggest they were not always confident of their identifications of *Bradypterus* on Mulanje, but they nevertheless seem to have found both species quite common, and Jackson (1971) obtained specimens of both.

Doubtful field observations from elsewhere in Malawi are mentioned by Benson & Benson (1977: 149-50, 255). Until records of *B. cinnamomeus* from Zomba and its outlier Malosa are supported by specimens, sound recordings or critical field notes, we would agree with Benson & Benson that they cannot be admitted. However, Garcia's observations of *Bradypterus* in both forest and bracken-briar do suggest *a priori* that 2 species may be present. Benson & Benson also mention the need for further investigation in south-western Ntcheu District. This is in reference to the observations of Benson (1942: 314), who reported *B. mariae* from Mvai Mt and between Tsangano Mt and the Ntcheu border, in bracken-briar. In this habitat *cinnamomeus* might seem more likely, although Benson (*op. cit.*) mentions a specimen of *mariae* from Dzonze Mt, some 25 km south of Mvai.

We have accepted the sound record of *B. cinnamomeus* from bracken-briar on Chimaliro, reported by Benson (*op. cit.*), even though we have stressed the care needed to separate the two species on voice alone. Chimaliro, like Uzumara, is a northern element of the North Vipya, and is isolated from the Nyika (where *cinnamomeus* is common) by lowlands. The mountain is 2060 m high and has extensive forest (Chapman & White 1970: 134), in which *B. mariae* is certainly also to be expected. Uzumara and Chimaliro are both poorly-known ornithologically. Benson & Benson (1977) refer to there being no record of *mariae* from Ntchisi Mt, and certainly we know of no specimen from there. However, Benson (1940: 619) reported it as "very rare on Nchisi Mt", and in view of the occurrence of other montane forest species there, Benson (*in litt.*) agrees with us that this record is acceptable.

Subspecific distribution in Central Africa

We have not re-assessed all subspecific variation in these 2 *Bradypterus*. However, the divisions of White (1960) clearly require review in so far as he considered *B. mariae ufipae* to be synonymous with *B. cinnamomeus nyassae*. It does seem that *nyassae* is the form of *cinnamomeus* from Nguru in northeastern Tanzania southwards to Mulanje (Benson *in litt.*). As mentioned earlier, *B. mariae ufipae* appears to be longer tailed than adjacent *usambarae*, larger in body size and perhaps whiter on the throat and abdomen. However, Fig. 3 clearly shows that there is no obvious barrier between the ranges of *ufipae* and *usambarae*. The populations of northeastern Zambia (*ufipae*) approach geographically the undoubted *usambarae* of southwestern Tanzania to the north of Lake Malawi. Further investigation is needed to determine the extent of any integradation in this area.

Benson (*in litt.*) has also re-examined specimens of *B. barratti boultoni* from western Angola. He confirms that this very isolated population is rightly placed with the *barratti* group, and not with *cinnamomeus*. The 2 specimens examined have narrow rectrices and a tail/wing ratio of 1.02 and 1.03 (cf. Table 1). The heavy streaks on the chest of *boultoni* show a closer approach to the populations of southern Africa, than to those of *mariae* (*sensu stricto*) in the east.

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References:

Belcher, C.F. 1925. Birds on the Luchenya Plateau, Mlanje, Nyasaland. *Ibis*. Ser. 12(1): 797–814.

Benson, C.W. 1940. Further notes on Nyasaland birds (with particular reference to those of the Northern Province) – Part III. *Ibis*. Ser. 14(4): 583–629.

— 1942. Additional notes on Nyasaland birds. Part 2. *Ibis*. Ser. 14(6): 299–337.

— 1946. A new race of Scrub-Warbler from Southern Rhodesia. *Ostrich* 17: 197–199.

— 1956. New or unusual records from Northern Rhodesia. *Ibis*. 98: 595–605.

— & Benson, F. M. 1977. *The Birds of Malawi*. Limbe: Montfort Press.

— ,Brooke, R. K., Dowsett, R. J. & Irwin, M. P. S. 1971. *The Birds of Zambia*. London: Collins.

Chapman, J. D. & White, F. 1970. *The Evergreen Forests of Malawi*. Oxford: Commonwealth Forestry Institute.

Dowsett, R. J. & Prigogine, A. 1974. The avifauna of the Marungu Highlands. *Exploration hydrobiologique du bassin du lac Bangweolo et du Luapula* 19: 1–67.

Grant, C. H. B. & Mackworth-Praed, C. W. 1941. A new race of Bracken Warbler from Tanganyika Territory and a new race of Moustached Warbler from Abyssinia. *Bull. Brit. Orn. Cl.* 62: 30–31.

Hall, B. P. & Moreau, R. E. 1970. *An Atlas of Speciation in African Passerine Birds*. London: British Museum (Nat. Hist.).

Jackson, H. D. 1971. Ornithological results of the 1970 National Museums of Rhodesia expedition to Malawi. *Arnoldia (Rhod.)* 5(12): 1–10.

Keith, S. 1971. *In:* Keith, S. & Gunn, W. W. H. (producers). *Sounds of nature: Birds of the African Rain Forests*. (Text and 2 records.) Federation of Ontario Naturalists & American Museum of Nat. Hist.

Oatley, T. B. 1969. Bird ecology in the evergreen forests of north-western Zambia. *Puku* 5: 141–180.

Penry, E. H. & Talbot, J. N. 1975. Notes on the birds of the higher altitudes of Mulanje Mountain, Malawi. *Honeyguide* 82: 14–25.
Vincent, J. 1935. The birds of northern Portuguese East Africa. Part 8. *Ibis*. Ser. 13(5): 485–529.
White, C. M. N. 1960. A Check List of the Ethiopian Muscicapidae (Sylviinae). Part I. *Occ. Papers Nat. Mus. S. Rhod.* 24B: 399–430.

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Recent additions to the Zambian List

by R. J. Dowsett

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Benson *et al.* (1971) accepted the undoubted occurrence of 698 species in Zambia (excluding the now extinct Ostrich *Struthio camelus*). Subsequently, to the end of 1978, 18 species have been proven to occur in Zambia for the first time (and full details are awaited of at least 2 more species). In addition, confirmatory evidence has been obtained for 4 species whose occurrence was doubted, or at least not accepted unequivocally, by Benson *et al.* Most of these additional records have been documented, severally, in the *Bulletin of the Zambian Ornithological Society* (1969-78, Vols. 1-10). As this cyclostyled publication is not widely available outside Zambia, the following synthesis seems desirable. Unless stated otherwise, all specimens and copies of all photographs mentioned are held in the Livingstone Museum.

EGRETTA VINACEIGULA *Slaty Egret*. First noticed at Blue Lagoon in the early 1960s (R. A. Critchley), and subsequently at Lochinvar, where I caught and ringed 2 on 9.x.1969. At the time, *vinaceigula* was considered to be a colour phase of the Black Egret *E. ardesiaca,* and no mention was made of it by Benson *et al.* Subsequent to the reviews of its apparent specific status by Benson, Brooke & Irwin (1971) and Vernon (1971), it has been recognised at several localities in Zambia, from the Zambezi River north to the Bangweulu Swamps and Nchelenge District. Its distribution is considered in more detail by Dowsett (in press a), who shows that there are records for all months. There are specimens from Namwala District (J. F. R. Colebrook-Robjent) and Mongu District (T. O. Osborne), and several observers possess photographs from Lochinvar and Choma District.

GYPS COPROTHERES *Cape Vulture*. Two adults were seen and photographed at Lochinvar on 8.x.1974 (T. O. Osborne, Sir Peter Scott, *et al.*). Lady Scott's photographs have been examined by P. J. Mundy, who (*in litt.*) confirms the identification. One was seen at Lochinvar on 26.v.1977 (G. P. Robinson *et al.*), and I have confirmed the identity from photographs in Mr. Robinson's possession. Other Cape Vulture records have been claimed, but none has been documented satisfactorily. The Lochinvar birds were presumably non-breeding visitors.

HIERAAETUS PENNATUS *Booted Eagle*. Benson *et al.* (p. 68) mention 4 sight records. Subsequently, this Palaearctic migrant has been seen on numerous occasions by competent observers. At the end of Feb. 1978 there were 69 fully acceptable records, falling between 2.x. and 28.iv., with additional sightings in August (1) and September (2). These latter, although in need of confirmation, are of interest in view of recent breeding records in South Africa, reviewed by Martin *et al.* (1978). A claimed breeding record for Zambia, of c/2 in a tree nest, on 6.iii.1936 (Cottrell 1938) is not acceptable, unless the eggs can be re-examined and proved to belong to this species. Most Zambian sightings are from the south and east, but this may be an artefact. There are still neither specimens nor photographs, but some individuals have been watched very closely, and there can be no reason for excluding the Booted Eagle from the Zambian List.

AQUILA NIPALENSIS *Steppe Eagle*. Several sight records of this Palaearctic migrant were mentioned by Benson *et al.* (p. 69), and many have been seen by competent observers subsequently. Extreme dates of acceptable sightings are 29.ix. and 9.iv., most falling between mid-Oct and mid-Mar. I collected 2 specimens at Lochinvar in Nov 1970 (Brooke *et al.* 1972), and have photographed others there.

VANELLUS SUPERCILIOSUS *Brown-chested Wattled Plover*. Up to 3 were well seen at Mwinilunga on 1–2.x.78 (P. St. J. Bowen). This intra-African migrant was to be expected in the extreme northwest of Zambia, in view of a specimen taken 13.x. at Kasaji in the Shaba Province of Zaire (Schouteden 1971).

PLUVIALIS DOMINICUS *Eastern Golden Plover*. One was seen and photographed at Kafubu Dam, near Ndola, 30.x.–5.xi.1972 (S. G. Madge, G. P. Robinson, *et al.*), and one was seen at the same place 4.xi.1973 (C. Carter, D. K. Richards). Two at Lusaka, 22–23.x.1975 were both collected (D. R. Aspinwall). At Lochinvar, Aspinwall reported 2 on 12.ii.1977 and one on 16.x.1977. Presumably these birds were on passage to and from non-breeding quarters on the southwestern coast of Africa (Dowsett in press b). Unfortunately it is not possible to allocate the Lusaka specimens to subspecies with any degree of certainty.

CHARADRIUS LESCHENAULTII *Great Sandplover*. One was seen and photographed near Kafue town between 9 and 22.xi.1972 (D. R. Aspinwall, R. J. Dowsett, *et al.*). One at Lusaka 20–23.x.1975 was collected (Aspinwall). Singles have also been seen at Blue Lagoon, 25.ix.–3.x.1976 (Aspinwall, Dowsett, *et al.*), Kafubu Dam, 8–10.xi.1976 (P. B. Taylor) and Mwinilunga, 27.xi.1978 (P. St. J. Bowen). This Palaearctic migrant may be annual on passage to non-breeding quarters in coastal southwestern Africa (Dowsett in press b).

LIMOSA LIMOSA *Black-tailed Godwit*. In the northern winter of 1972/73 there were 4 sightings of this species in Zambia. At Lochinvar a party of 10 was reported 24.ix.1972 (D. K. Richards, G. P. Robinson, *et al.*) and a single was there 1.i.1973 (R. J. Douthwaite, J. J. Tucker). At Lusaka one was present 20.i.–4.ii.1973 (H. Hallen, *et al.*), and excellent photographs were obtained by I. C. Tanner. One at Luanshya 11–18.iii.1973 (M. I. Meadows, D. K. Richards, *et al.*) was reportedly also photographed. A few records have been claimed subsequently, but only one is completely acceptable, a single bird seen by D. K. Richards at Luanshya, 23.xii.1973.

Unlike the Bar-tailed Godwit *L. lapponica* – which winters on the African coasts, and ought to occur annually on passage across Zambia – all Black-tailed Godwits in Africa are normally inland, north of the equator. It is tempting to correlate these southern occurrences with similarly abnormal numbers of Garganey *Anas querquedula* in Zambia in 1972/73, except that even larger numbers of this duck were reported in 1973/74 (see footnote to Irwin 1974). Clark *et al.* (1974) mention records of Black-tailed Godwit even further south in 1972/73, from Botswana, Rhodesia and 2 localities in the Transvaal of South Africa, clearly part of the movement observed in Zambia. (Incidentally, they erroneously credit both Lochinvar records to A. J. Tree, instead of to the observers mentioned above.) There were further records in the Transvaal through to June 1975 (Skead & Dean 1977). Birds at both Transvaal localities in 1972/73 stayed throughout the breeding season, and so 1973/74 records may be of birds left over from the previous year.

GALLINAGO GALLINAGO *Common Snipe*. There have been no observations subsequent to those resuscitated by Button (1973), but it is likely this species is overlooked in northern Zambia.

CALIDRIS TEMMINCKII *Temminck's Stint*. Early in 1977 this species was seen at 3 localities in Zambia. Three birds were near Mazabuka on 5.i.1977 (S. Brogger-Jensen), one near Ndola 6 and 15.ii. (P. B. Taylor) and one at Kitwe 15.ii. (E. H. Penry). The Ndola bird was photographed. As with the Black-tailed Godwit, this species normally spends the non-breeding season inland in Africa, north of the equator.

LIMICOLA FALCINELLUS *Broad-billed Sandpiper*. One was well seen and photographed at Mufulira, 1–2.xi.1975 (G. P. Robinson, *et al.*). It might be expected that very small numbers cross Zambia annually, on passage to the southwestern coast (Dowsett in press b).

SCHOUTEDENAPUS MYOPTILUS *Scarce Swift*. Benson *et al.* (p. 147) refer to 2 sight records from the Nyika Plateau. It has subsequently been found commonly there and is probably resident, there being records for most months of the year. It has also been reported from the Mafinga Mountains. Fuller details of these records are given by Dowsett & Dowsett-Lemaire (1978).

Bycanistes brevis *Silvery-cheeked Hornbill*. In the Nyikamwaka area (10° 10′ S, 33° 28′ E) at least 2 were well seen on 18–19.v.1975 (T. O. Osborne). In Dec 1976 birds were seen in the Mafinga Mountains and on the Zambian side of the Nyika Plateau by D. R. Aspinwall. The status of this unmistakeable bird is uncertain, but it appeared to be absent from the Nyika in Dec 1975 and 1977 (R. J. Dowsett & F. Lemaire). With the exception of a single sight record from the Malawi side of the Nyika in Oct 1973 (Dowsett 1974), numerous dry season visits to this area by many observers have produced no other reports.

Lybius lacrymosus *Spotted-flanked Barbet*. Two were seen at Kawimbe in Mbala District (8° 50′ S, 31° 32′ E) on 12.ii.1972 (R. Stjernstedt). Subsequently this species has been found locally not uncommon further south in the Chambeshi River valley to Mbesuma, at about 10° S (D. R. Aspinwall, R. J. Dowsett, *et al.*). A specimen that I collected at Mbesuma was kindly examined by M. P. Stuart Irwin, who allocated it to the race *ruahae*.

This barbet is clearly resident in northern Zambia. The map in Fig. 1 is taken from the provisional draft of *An Atlas of the Birds of Zambia* (Dowsett in prep.), and shows the

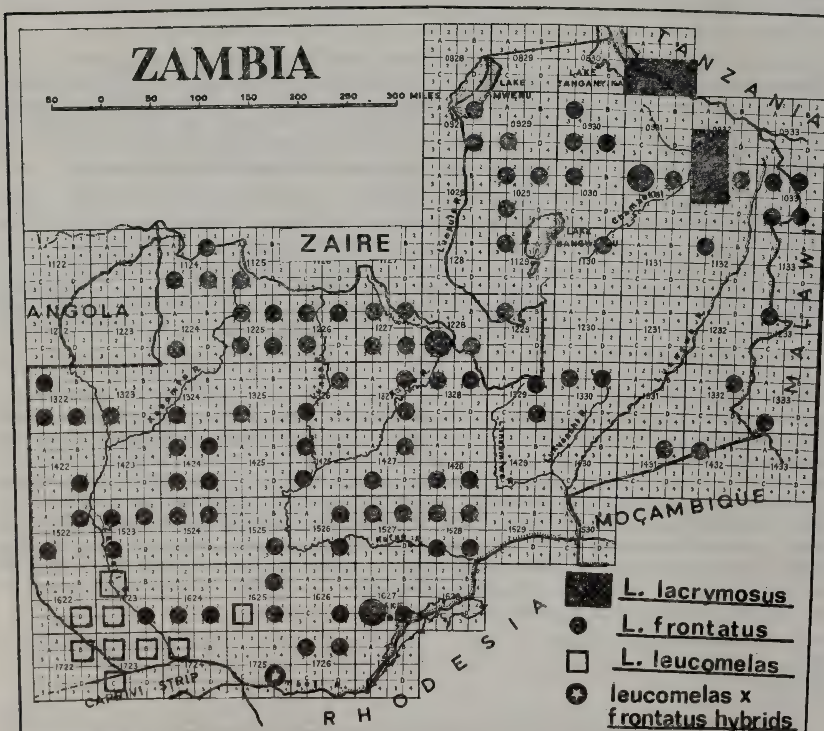

Figure 1

distribution of *lacrymosus* in relation to the other two barbets of the subgenus *Tricholaema* that are known from Zambia (the report of *T. hirsutum* near Lusaka by Ulfstrand & Alerstam (1977) being based on a misidentification). It is clear that *lacrymosus* and *frontatus* have a wide geographical overlap, but they appear to be segregated ecologically (though they may occur within sight or sound of each other). Whereas *lacrymosus* occurs in evergreen thicket on termite hills in otherwise *Acacia*-dominated areas, *frontatus* is a bird of deciduous miombo woodland. The possibility of hybridisation in areas of overlap cannot be ruled out, although it is likely that hybridisation between *frontatus* and *leucomelas* at Livingstone is a result of habitat degradation.

CAMPETHERA CAROLI *Brown-eared Woodpecker*. Along the Jimbe Stream (10° 57′ S, 24° 05′ E) in northern Mwinilunga District, I collected a pair on 28.vii.1973. Subsequently, this evergreen forest species has proved to be resident there, and has been seen at other localities, south to the Isombu (Lisombo) Stream (C. Carter, P. B. Taylor). Benson *et al.* (p. 181), in suggesting that *caroli* might occur in Mwinilunga, gave it the name Buff-spotted, in confusion with *C. nivosa*.

EREMOPTERIX LEUCOPAREIA *Fischer's Finch Lark*. First reported from Zambia, at Lundazi, 22–23.xii.1976 by D. R. Aspinwall. During Sep 1977 there appeared to be 20–30 pairs in the area, and they are possibly resident (D. Rafferty). I collected a ♂ there on 20.xii.1977, in non-breeding condition. Presumably this species is a recent arrival at Lundazi, where there has been much opening-up of the woodland for agriculture. Certainly one might have expected E. L. Button to find it when he resided there in the 1940s and 50s. On the other hand, the possibility of a seasonal movement from elsewhere cannot yet be ruled out, the evidence for such movements in Malawi being suggested by Benson & Benson (1977).

HIRUNDO SPILODERA *South African Cliff Swallow*. Diagnostic views were obtained of one on Chitunta Plain, Mwinilunga District, 13.xi.1978 (R. J. Dowsett). This is an intra-African migrant, most of which possibly travel between South Africa and the lower Congo basin to the west of Zambia. First birds arrive back on breeding grounds in the Transvaal in early August (Skead & Dean 1977), but the apparent lateness of the Chitunta bird is matched by some Zambian records of Greater Striped Swallow *H. cucullata*, a species which seems to have a similar migration.

PHYLLASTREPHUS PLACIDUS *Olive Mountain Bulbul*. This montane species was first found in the Mafinga Mountains in Aug 1971, when I collected specimens there at over 2000 m (Dowsett & Stjernstedt 1973). Since then, it has been found in this area down to about 1800 m in riparian forest (D. R. Aspinwall). I have given elsewhere (Dowsett 1972) reasons for considering *placidus* a species distinct from *P. cabanisi*, and R. Stjernstedt (pers. comm.) has further evidence of vocal differences.

The English name used above is that recommended by Dowsett & Stjernstedt (1973), and it appears much preferable to "Placid Bulbul" as used by Benson & Benson (1977) and others. It is a noisy species, and so "placid" seems meaningless. C. W. Benson (*in litt.*) tells me that Shelley's original description of *Xenocichla placida* offers no explanation for the use of this name.

SHEPPARDIA SHARPEI *Sharpe's Akalat*. Benson *et al.* (1970: 51) suggested that this small montane forest robin was absent from the Zambian (western) side of the Nyika Plateau. However, it was found there in May and June 1974 by T. O. Osborne, and we now know that is is present in several forest patches, being especially numerous in Manyenjere forest. In Dec 1977, F. Lemaire and I found at least 4 ♂♂ in Manyenjere singing within sound of each other. They favour areas of thick under-scrub inside the forest, and are thus patchily distributed. Osborne collected a specimen, and in Dec 1975 I caught and ringed 3 birds, 2 of them juvenals from eggs laid the previous month. Prior to discovery on the Nyika, this akalat was found in the Mafinga Mountains on 30.viii.1972 by D. R. Aspinwall (see postscript to Dowsett & Stjernstedt 1973).

HIPPOLAIS OLIVETORUM *Olive-tree Warbler*. This Palaearctic migrant has occurred in Zambia on at least 3 occasions. I collected a specimen at Lochinvar 27.xi.1973, one was ringed and photographed at Lusaka 17.xii.1974 (J. J. Tucker, *et al.*) and I watched a singing bird at very close quarters near Mambova on 26.i.1975. In addition, 3 sight records by D. R. Aspinwall from Feira District are probably correct (one on 25.xi.1973, 2 singles 8.ii.1975), but descriptions do not seem to rule out entirely the less likely possibility of Upcher's Warbler *H. languida*. It is not surprising that small numbers should occur on passage, with some apparently wintering in *Acacia* country in southern Zambia.

PHYLLOSCOPUS RUFICAPILLA *Yellow-throated Warbler*. Specimens were collected in the Mafinga Mountains in Aug 1971 (Dowsett & Stjernstedt 1973). This is still the only area from which this montane species is known in Zambia. It is conspicuous in forests on the Malawi side of the Nyika Plateau, on the eastern escarpment, but is apparently,f or no obvious reason, absent from the Zambian side.

PLATYSTEIRA CASTANEA *Chestnut Wattle-eye*. This monarchine flycatcher was found in riparian forest at 2 neighbouring localities in the extreme north of Mwinilunga District on 14.viii.1976 (D. R. Aspinwall). Birds of both sexes were seen on 3 occasions and their call tape-recorded. This is one of many species of the Congo forests which is at its southern

limit in the north of Mwinilunga; several other species known from Kasaji, 90 km to the northwest in Zaire (Schouteden 1971), may in time be found in Zambia.

Acknowledgements: I am very grateful to the observers mentioned above for details of their records, and to those referees who have examined and criticised specimens and field descriptions. Mr. C. W. Benson has kindly commented on a draft of this paper.

References:

Benson, C. W. & Benson, F. M. 1977. *The Birds of Malawi.* Limbe: D. W. K. Macpherson (sponsor).

Benson, C. W., Brooke, R. K., Dowsett, R. J. & Irwin, M. P. S. 1970. Notes on the birds of Zambia. *Arnoldia (Rhod.)* 4(40): 59 pp.

— 1971. *The Birds of Zambia.* London: Collins.

Benson, C. W., Brooke, R. K. & Irwin, M. P. S. 1971. The Slatey Egret *Egretta vinaceigula* is a good species. *Bull. Brit. Orn. Cl.* 91: 131–133.

Brooke, R. K., Grobler, J. H., Irwin, M. P. S. & Steyn, P. 1972. A study of the migratory eagles *Aquila nipalensis* and *A. pomarina* (Aves: Accipitridae) in southern Africa, with comparative notes on other large raptors. *Occ. Pap. Natn. Mus. Rhod.* B5(2): 61–114.

Button, E. L. 1973. The Common Snipe *Gallinago gallinago* in Zambia. *Bull. Brit. Orn. Cl.* 93: 174.

Clark, A., Madden, S. T. & Milstein, P. le S. 1974. Black-tailed Godwit influx. *Bokmakierie* 26: 101.

Cottrell, J. A. 1938. Nesting of the Booted Eagle *Hieraaetus pennatus. Ostrich* 9: 97–98.

Dowsett, R. J. 1972. Is the bulbul *Phyllastrephus placidus* a good species? *Bull. Brit. Orn. Cl.* 92: 132–138.

— 1974. Some new bird distribution records for Malawi. *Society of Malawi Jnl.* 27(2): 32–36.

— & Dowsett-Lemaire, F. 1978. The voice of the Scarce Swift *Schoutedenapus myoptilus. Scopus* 2: 51–52.

— & Stjernstedt, R. 1973. The birds of the Mafinga Mountains. *The Puku* 7: 107–123.

Dowsett, R. J. in press a. Breeding and other observations on the Slaty Egret *Egretta vinaceigula. Bull. Brit. Orn. Cl.*

— in press b. Migration across the continent of Africa by coastal waders. *Le Gerfaut.*

Irwin, M. P. S. 1974. The Pintail *Anas acuta* in Rhodesia. *Bull. Brit. Orn. Cl.* 94: 56–57.

Martin, J., Martin, E. & Martin, R. 1978. Booted Eagles breeding in the north-eastern Cape. *Bokmakierie* 30: 48–51.

Schouteden, H. 1971. La Faune Ornithologique de la Province du Katanga. *Mus. Roy. l'Afr. Centr., Doc. Zool.* no. 17: 248 pp.

Skead, D. M. & Dean, W. R. J. 1977. Status of the Barberspan avifauna, 1971–75. *Ostrich* Supp. 12: 3–42.

Ulfstrand, S. & Alerstam, T. 1977. Bird communities of *Brachystegia* and *Acacia* woodlands in Zambia. *J. Orn.* 118: 156–174.

Vernon, C. J. 1971. Observations on *Egretta vinaceigula. Bull. Brit. Orn. Cl.* 91: 157–159.

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Moult of the Long-billed Ringed Plover *Charadrius placidus*

by R. C. Taylor

Received 27 February 1979

The Long-billed Ringed Plover *Charadrius placidus* is a little studied eastern Palaearctic wader which breeds from the Middle Amur valley south through Manchuria and China to Japan, and possibly in Tibet (Vaurie 1965, 1972). Mainly it breeds inland on the shores of lakes and rivers, but has been reported breeding to a height of c 1000 m in Japan (Austin & Kuroda 1953).

In winter, the northern breeding populations move south and become partially synheimic with the resident southern populations, being recorded as far south as Vietnam (Waldash 1968) and Thailand (Jorgensen 1949), and as far west as Nepal (Ali & Ripley 1969).

The plumage of *C. placidus* is described fully by Kozlova (1961) but it has improperly been considered to resemble *C. hiaticula* (e.g. Dement'ev *et al.* 1969) though it differs in having bright cinnamon tips to the body feathers in

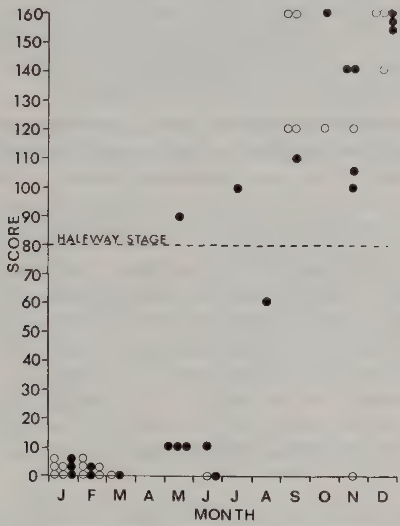

Fig. 1. Body moult scores of *Charadrius placidus*. Closed circles=southern resident birds; open circles=northern migratory birds. For method of scoring see text.

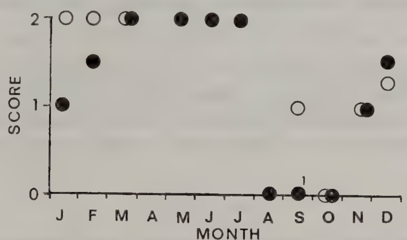

Fig. 2. Primary abrasion scores of *Charadrius placidus*. Symbols as in Fig. 1. For method of scoring see text.

fresh plumage Kozlova (1961) provides a qualitative, but incomplete, description of the moult. No quantitative descriptions of the moult have been published.

During a study of geographical variation in several *Charadrius* species (Taylor 1978) it was possible to investigate the timing of moult in *C. placidus*

using dated museum specimens, of which 45 adequately labelled individual skins were borrowed from the British Museum (Natural History) and the University of California (Berkeley). The extent of body moult was roughly quantified using a scoring system similar to that devised by Ferns (1978) for some Arctic waders. A 5-point scale (all old=0, beginning of moult=10, moderate moult=20, heavy moult=30, all new=40) was used to quantify the degree of moult in 4 regions of the body (coronal region of the capital tract, interscapular region of the dorsal tract, cervical and sternal regions of the ventral tract). Only a single bird in active primary moult was available, so a 3-point scale (new=0, moderately abraded=1, extensively abraded=2) was used to quantify the physical condition of the primaries in order to give some indication of the timing of primary moult.

The 45 specimens could be divided into 2 groups on the basis of their size and the date and locality of capture: 22 were considered to belong to northern migratory populations and 23 to southern sedentary populations. In view of geographical differences in the timing of moult observed in other species of waders (e.g. Holmes 1971) the 2 samples were analysed separately.

The pattern of body moult does not appear to be significantly different in the two groups (Fig. 1), although the paucity of specimens for the migratory group between March and September precludes any further comparison. There was no clear indication of a pre-alternate moult (terminology according to Humphrey & Parkes 1959); however, Kozlova (1961) reports a partial moult starting in January and ending in April, and although no active moult was observed in my series, the lack of abrasion of feathers in the loral, malar and cervical regions of specimens collected in January and February supports her observations.

The prebasic body moult begins in May and June and continues through to September, being generally complete by October in some birds, though continuing until December in others. Kozlova (1961) was unable to follow the timing of the prebasic moult due to lack of specimens, but considered that it began in early July, rather later than indicated by this study.

The prebasic moult of the primaries begins in August and continues until October in the southern populations. It may begin slightly later in the migratory populations (Fig. 2). One bird, considered to belong to the southern resident populations, in active primary moult, was collected in the Yangtse Valley, China, on 18 September. It had replaced all but the outer 3 primaries.

DISCUSSION

The energy expenditure involved in feather replacement (King & Farner 1961) is such that moult is not usually simultaneous with periods of high energy expenditure such as reproduction and migration, and wading birds have adopted 3 strategies to help minimise any overlap. Holmes (1971) has shown that Arctic *Calidris* species either complete the prebasic moult whilst on, or near, the breeding grounds, or moult upon reaching their winter quarters, or beginning the moult on the breeding grounds arrest it during or prior to migration and complete it upon arrival in the winter quarters. Different populations of the same species adopt different strategies depending upon the conditions in the localities in which they breed and winter.

There is no evidence from this study to show that there is any difference between the northern and southern populations in the timing of the prebasic body moult, and data are insufficient for drawing any conclusions regarding the pre-alternate moult.

The present data suggest that the prebasic primary moult of the adults may begin slightly later, possibly by about one month, in the northern populations. From the small amount of data on the breeding biology available, it appears that the southern populations begin breeding in mid-March (Austin & Kuroda 1953), whilst the northern populations do not arrive on their breeding grounds until the end of March (Kozlova 1961). If the length of breeding season is the same in both populations (no data are available on incubation periods), it is possible that the southern populations will finish breeding about one month before the northern populations; and if moult only then ensues, the start of the primary moult would be expected also to be one month apart.

There is some evidence from the primary moult data (Fig. 2) that the duration of this moult may be shorter in the northern migratory populations. The primary feather abrasion scores indicate an extension of the moult into the winter period in the southern populations, whereas it may finish before arrival in the winter quarters for the northern populations. This is similar to the situation found in several other species of migratory waders, where the migrant populations generally have more rapid moults than resident populations (Pienkowski *et al.* 1976).

The prebasic body moult in the northern populations begins before the birds leave the breeding grounds, and its duration (August to December) is such that it almost certainly occurs simultaneously with migration, which is not unusual (Ferns 1978).

The timing and duration of moult in *C. placidus* is probably closely synchronized with the timing of other annual activities, but is probably different in the northern and southern populations. Considerably more field data are needed before firm conclusions can be reached.

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References:

Ali, S. & Ripley, S. D. 1969. *Handbook of the Birds of India and Pakistan,* Vol. 2. Oxford University Press.

Austin, O. L. & Kuroda, N. 1953. The birds of Japan, their status and distribution. *Bull. Mus. Comp. Zool. Harv.* 109: 277–637.

Dement'ev, G. P., Gladkov, N. A. & Spangenberg, E. P. 1969. *Birds of the Soviet Union.* Vol. 3. Israel Program for Scientific Translations: Jerusalem.

Ferns, P. N. 1978. The onset of prebasic body moult during the breeding season in some high-Arctic waders. *Bull. Brit. Orn. Cl.* 98: 118–122.

Holmes, R. T. 1971. Latitudinal differences in the breeding and molt schedules of Alaskan Red-backed Sandpipers. *Condor* 73: 93–99.

Humphrey, P. S. & Parkes, K. C. 1959. An approach to the study of molts and plumages. *Auk* 76: 1–31.

Jorgensen, A. 1949. Siams Vadefugle. IV. Charadriidae (Scolopacinae, Recurvirostrinae), Rostratulidae, Jacanidae; Supplement, Literatur. *Dansk Orn. Foren. Tidsskr.* 43: 261–279.
King, J. K. & Farner, D. S. 1961. Energy metabolism, thermoregulation and body temperature. *In* A. J. Marshall (ed.) *Biology and Comparative Physiology of Birds*. Vol. 2: 215–288. Academic Press: London.
Kozlova, E. V. 1961. *The Fauna of the U.S.S.R.* Vol. 1. Academy of Sciences U.S.S.R.: Moscow-Leningrad.
Pienkowski, M. W., Knight, P. J., Stanyard, D. J. & Argyle, F. D. 1976. The primary moult of waders on the Atlantic coast of Morocco. *Ibis*. 118: 347–365.
Taylor, R. C. 1978. Geographical variation in wading birds with reference to the Ringed Plover (*Charadrius hiaticula* L.) and related species. Unpubl. Ph.D. thesis, Liverpool Polytechnic.
Vaurie, C. 1965. *The Birds of the Palearctic Fauna. Non-passeriformes*. Witherby: London.
Vaurie, C. 1972. *Tibet and its Birds*. Witherby: London.
Waldash, P. 1968. *Birds of South Vietnam*. Charles E. Tuttle Co: Rutland, Vt.

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Clutch sizes of Seychelles' endemic land birds

by J. Watson

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This note combines recent published information on clutch sizes of Seychelles' endemic land birds with substantial new data, correcting erroneous statements that have occurred in the literature for several species, especially the Kestrel *Falco araea*, Magpie Robin *Copsychus sechellarum* and Paradise Flycatcher *Terpsiphone corvina*, while for several others little, if anything, has been published. New information presented here has been collected during 3 years field research (1975-78) on a number of Seychelles' land birds. Table 1 summarises the information presented below for each of the 11 endemic species.

FALCO ARAEA Loustau-Lalanne (1962) states that the Seychelles Kestrel lays a C/2 and Penny (1974) mentions C/1 or C/2. However, in 1975, 24 complete clutches were observed, 17 of 3 eggs and 7 of 2 eggs; a similar pattern was observed in 1976 but in 1977 there were more clutches of 2 than 3 (Watson in prep.).

ALECTROENAS PULCHERRIMA Penny (1974) states that the clutch of the Blue Pigeon can be either one or 2, though he gives no authority for this statement. Vesey-Fitzgerald (1940) described a nest with one egg and this appears to be the only published record. During the 3 years 1975-77, 9 nests were located, 5 containing one egg and the remainder each held a single chick (pers. obs.). C/1, therefore, seems to be usual for this species.

OTUS INSULARIS The Scops Owl is the least known of all Seychelles' endemic birds and remains the only species whose nest has yet to be found. There is no published information on breeding but, during 1975-77 on Mahé, 3 different pairs of adults were observed with recently fledged young;

in each case only one young bird was involved. C. J. Feare (pers. comm.), in 1978, observed a group of 3 birds, 2 adults and one (presumed) youngster. For this species, it therefore seems likely that the clutch is small, perhaps only a single egg.

Collocalia (francica) elaphra The colonial nesting site of the Cave Swiftlet was first discovered as recently as 1970 (Procter 1972). Four nests in the original description contained one egg. Between July 1977 and 1978 this colony on La Digue was visited at monthly intervals; 43 nests with eggs were observed and 42 of these held C/1 (pers. obs.). The exceptional nest contained C/2 but there was a distinct possibility that two females had laid in the same nest; when visited one month later the nest held one chick.

Table 1

Clutch sizes of Seychelles land birds

Species	Clutch Size	Comments
Falco araea	2 or 3*	Numbers of C/2 and C/3 vary from year to year
Alectroenas pulcherrima	1*	More data needed to confirm absence of 2-egg clutches
Otus insularis	(1)**	Based only on numbers of fledged young
Collocalia (francica) elaphra	1	One clutch of 2 is attributed to 2 different females
Hypsipetes crassirostris	(1 or 2)*	Data from a nest and fledged young are conflicting
Copsychus sechellarum	1*	May occasionally lay C/2
Bebrornis sechellensis	1 or 2	C/2 is much less frequent
Terpsiphone corvina	1*	Invariably, at least in recent years
Nectarinia dussumieri	1	Invariably
Zosterops modesta	(2)**	Based only on one nest and 2 fledged broods
Foudia sechellarum	1 or 2*	C/1 occurs less frequently

*Clutch size given here differs from previously published information, mostly in Penny (1974)

**There has been no previously published figure for clutch size in these species

( ) Bracketed figures indicate that more data are needed on these species

Hypsipetes crassirostris A nest of this bulbul, mentioned by Vesey-Fitzgerald (1940), contained 2 eggs. This is the only documented clutch. Greig-Smith (in press, a) mentions a sample of immature birds seen in association with adults; 92 instances were of single young birds, 7 were of groups of 2 and one was of a group of 3. It seems possible that C/1 may be more usual than C/2, though clearly more data are needed.

Copsychus sechellarum According to Vesey-Fitzgerald (1940), the eggs are "said to be two in number", but evidently he did not locate a clutch himself. Loustau-Lalanne (1962) also gives C/2, but his evidence was based on only one nest. Penny (1974), without adding any new data, states simply that "the clutch is usually two". However, during 12 months research on Fregate (July 1977-78), 12 nests were found and all contained one egg; a

further 8 were first visited when they had young, in each case a single chick (Watson 1978). It seems therefore that C/1 is normal, although it is possible that a situation exists comparable to the Brush Warbler *Bebrornis sechellensis* (see below).

Bebrornis sechellensis The Brush Warbler has been studied intensively by Diamond (in prep.) who has found C/1 to be usual, but that occasionally most pairs in the population will, simultaneously, lay C/2. It is probable that this reflects exceptional food availability. Gaymer *et al.* (1969) make no mention of clutch size in this species but Penny (1974) agrees that one egg is usual though 2 sometimes occur.

Terpsiphone corvina Gaymer *et al.* (1969) give a figure of "one or 2 eggs, possibly sometimes 3". Penny (1974) is more conservative, stating that the clutch is "one or occasionally 2". However Fraser (1972) gives details of 4 nests, all with one egg and A. Niol (pers. comm.) has never, in 8 years spent studying this species on La Digue, recorded a clutch other than one. J. W. and A. Niol documented the complete breeding history of 65 nests on La Digue 1977-78 and all held C/1 (Watson & Niol in prep.).

Nectarinia dussumieri The nest of this sunbird, containing one egg, was the first nest to be described from these islands (Newton 1867). Williams (1953) refers to "a number of nests" all of which held a single nestling, concluding that the full clutch was one. Gaymer *et al.* (1969) and Penny (1974) add no new information but Greig-Smith (in prep.) recorded C/1 in all the nests he observed. In 1977-78 on Fregate, 5 nests were examined during incubation and all contained one egg (pers. obs.).

Zosterops modesta Gaymer *et al.* (1969) stated that nothing was then known of the breeding of the Grey White-eye and Penny (1974) stressed again that its nest had not been seen. Feare (1975) did locate a nest in 1973, though no eggs were laid on that occasion. It was not until October 1976 that the eggs were first seen, the completed clutch being 2 (Greig-Smith in press b). This and the following observations tentatively suggest that C/2 may be usual for this species. A fledged brood of 2 was observed in the same area as the above nest in March 1976 and, following the failure of the October attempt, a successful nest in November 1976 again gave rise to 2 fledglings (pers. obs.).

Foudia sechellarum For this fody Crook (1961) gives 66 clutches, 15 with one egg and 51 with 2. Penny (1974) however, without giving an authority, says that "the clutch is 2 or 3". Data from Crook's (1961) intensive study are likely to be more reliable.

Clearly, to provide a more complete picture, information is still needed for a number of these species, particularly *H. crassirostris, O. insularis* and *Z. modesta*. There will be no great difficulty in obtaining data for *H. crassirostris,* which occurs abundantly on 4 of the islands. However, for the other 2 species, attempts to learn more about their breeding biology will always be hampered by their rarity and restricted ranges; both have very small populations confined to high altitude forest on Mahé.

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References:

Crook, J. H. 1961. The fodies of the Seychelles Islands. *Ibis* 103a: 517–548.

Feare, C. J. 1975. Observations on the Seychelles White-eye *Zosterops modesta*. *Auk* 92: 615–618.

Fraser, W. 1972. Notes on *Terpsiphone corvina*. *Ibis* 114: 399–401.

Gaymer, R., Blackman, R. A. A., Dawson, P. G., Penny, M. & Penny, C. M. 1969. The endemic birds of Seychelles. *Ibis* 111: 157–176.

Greig-Smith, P. W. (in press a). Notes on the biology of the Seychelles bulbul. *Ostrich*.

Greig-Smith, P. W. (in press b). Observations on the nesting and group behaviour of the Seychelles White-eye *Zosterops modesta*. *Ibis*.

Loustau-Lalanne, P. 1962. Land birds of the granitic islands of the Seychelles. *Occ. Publs. Seychelles Soc.* 1: 32 pp.

Newton, E. 1867. On the land-birds of the Seychelles Archipelago. *Ibis* (2) 3: 335–360.

Penny, M. 1974. *The birds of the Seychelles and the outlying islands*. Collins: London.

Procter, J. 1972. The nest and the identity of the Seychelles swiftlet *Collocalia*. *Ibis* 114: 272–273.

Vesey-Fitzgerald, D. 1940. The birds of the Seychelles – 1. The endemic birds. *Ibis* (14) 4: 480–489.

Watson, J. 1978. The Seychelles Magpie Robin *Copsychus sechellarum*. Report on World Wildlife Fund project 1590. 63 pp.

Williams, J. G. 1953. On the status of the Seychelles Sunbirds *Cyanomitra dussumieri* and *C. mahei*. *Ibis* 95: 545–546.

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A new subspecies of the Elepaio *Chasiempis sandwichensis*, from the Island of Hawaii

by H. Douglas Pratt

Received 19 March 1979

The Elepaio *Chasiempis sandwichensis*, a monarchine flycatcher endemic to the Hawaiian Islands, exhibits a wide range of plumage variation. Early naturalists designated as many as 5 species (Stejneger 1887), but soon the fact that some of these represented females or immatures became apparent. Wilson & Evans (1890-99), Rothschild (1893-1900), Henshaw (1902), Perkins (1903), and MacCaughey (1919) recognized 3 species: *C. sclateri* of Kauai, *C. gayi* of Oahu and *C. sandwichensis* of Hawaii. Bryan & Greenway (1944) and most subsequent authors considered these forms conspecific. The Kauai and Oahu Elepaios exhibit little variation, but those from Hawaii are highly variable. The extent of this intra-island variation is apparent from the figures presented by Wilson & Evans (1890-99) and Rothschild (1893-1900).

Henshaw (1902) was the first to examine intra-island variation in *Chasiempis*. He concluded that 2 subspecies could be defined on Hawaii, the nominate

form occurring in the drier parts of the island, with a darker form, *C. sandwichensis ridgwayi*, found in the wet windward forests north and south of Hilo. Neither of these taxa is represented by a holotype, but Henshaw (1902) considered the type locality of *C. s. sandwichensis* to be Kealakekua Bay in Kona. No locality was designated for *C. s. ridgwayi,* and the name was based on a colour plate presented by Sclater (1885). Subsequent authors synonymized these races and generally ignored the intra-island variation of *C. sandwichensis* on Hawaii.

As part of a general systematic review of Hawaiian birds (Pratt 1979), I have re-examined Henshaw's specimens and compared them with others from most of the range of the Elepaio on Hawaii. I found that not only are Henshaw's subspecies valid, but a third recognizable form occurs on the high leeward slope of Mauna Kea, a part of the island not visited by earlier collectors. The details of this intra-island subspeciation will be published as part of the above-mentioned monograph, and in order that a name will be available for use in that discussion, I offer the following description (capitalized colour names from Smithe 1975) of the Mauna Kea population which may be called

Chasiempis sandwichensis bryani subsp. nov.

Type. Adult ♂, collected 27 August 1976 by H. Douglas Pratt (original number 545) at Puu Laau, Hamakua District, Hawaii County, Hawaii, elevation c. 1950 m. No. 81725, Louisiana State University Museum of Zoology.

Diagnosis. Palest and greyest of all forms of *Chasiempis sandwichensis* on the island of Hawaii. Head devoid of rufescent colouration; forehead, lores, malar region, superciliary line, and partial collar pure white; crown and nape Brownish Olive; auriculars and back Olive-Brown; breast streaks Antique Brown.

Females differ from males in having more extensive white in the throat, bordered posteriorly by a dusky band; having more white in the head region; and in having paler breast streaks.

Immatures resemble those of other subspecies on the island but are paler on the forehead, crown, and nape.

Measurements. (Holotype, followed by mean $\pm$ standard deviation and range of paratype series, mm) wing chord 75, 75 $\pm$ 2.7, 72-79; tail 68, 65 $\pm$ 3.4, 60-69; exposed culmen 12.9, 12.1 $\pm$ 0.5, 10.9-12.9; bill width 6.1, 6.1 $\pm$ 0.2, 5.6-6.4.

Paratypic variation. One ♂ has a tinge of rufous along the upper border of the white superciliary line and forehead, with the crown dark reddish Amber. Six ♂♂ have an Amber tinge to the breast streaks. One ♀ has a slight rufous tinge to the facial colouration.

Range. This subspecies appears to be presently confined to the mamane-naio forest of leeward Mauna Kea above about 1800 m. Its distribution probably coincides with that of the Palila *Loxioides bailleui* (van Riper *et al.* 1978). Several older specimens from lower elevations where Elepaios no longer occur appear to be referable to this subspecies.

Specimens examined. Seven adult ♀♀, 14 adult ♂♂, and 2 immatures of unknown sex, all from the type locality.

Etymology. I am pleased to name this subspecies in honour of Edwin H. Bryan, Jr., of the Pacific Scientific Information Center, Bernice P. Bishop Museum, Honolulu. He has not only made valuable original contributions to biological studies in the Pacific, but has also provided information and assistance to several generations of other scientists including the author.

Henshaw's (1902) diagnosis of *C. s. ridgwayi* is sufficient to distinguish it from *C. s. bryani,* but his description of the nominate race could be misinterpreted. His series includes several specimens from the Kau District, far removed from the range of *C. s. bryani,* that are very close to the new subspecies in the colour of the pale areas of the head. He apparently based his diagnosis on these atypical specimens. The possibility exists that the Kau population represents another describable taxon, but more material must be

Table 1

Plumage characters of the three subspecies of *Chasiempis sandwichensis* on the island of Hawaii

Character	*C. s. sandwichensis*	*C. s. ridgwayi*	*C. s. bryani*
Males			
Colour of breast streaks	Amber[1]	Chestnut to Amber	pale Amber to Antique Brown
Extent of breast colour	variable, never without streaks across breast	streaks tend to form solid colour band on breast	no solid colour, streaks often on sides only
Auriculars	Tawny to Cinnamon-Brown	averages darker than *sandwichensis*	Olive-Brown
Back colour	Cinnamon-Brown or Antique Brown	Cinnamon-Brown or darker	Olive-Brown
Colour of pale feathers of head	usually white tinged Cinnamon-Rufous rarely white	Chestnut/Amber to Cinnamon-Rufous never white	pure white
Crown colour	Amber or Cinnamon-Brown	dark reddish Amber or Amber	Brownish Olive
Females			
Colour of breast streaks	Cinnamon to Tawny	averages darker than *sandwichensis*	Tawny to Antique Brown
Extent of breast colour	variable	variable, often almost a solid colour band	dark streaks usually confined to sides
Dorsal colour	Antique Brown to almost Cinnamon	dark Cinnamon-Brown to Antique Brown	between Olive-Brown and Cinnamon-Brown
Colour of pale feathers of head	Cinnamon to white tinged with Cinnamon	dark Cinnamon-Rufous to white tinged with Cinnamon	pure white

[1]Capitalized colour names from Smithe (1975).

collected before the status of Elepaios from that area can be determined. Table 1 compares 6 plumage characters for males and 4 for females of the 3 named subspecies of *Chasiempis sandwichensis* on the island of Hawaii. If the enigmatic Kau birds are ignored, the table can be used to identify almost all specimens.

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References:
Bryan, E. H., Jr. & Greenway, J. C., Jr. 1944. Check-list of the birds of the Hawaiian Islands. *Bull. Mus. Comp. Zool.* 94: 92–140.
Henshaw, H. W. 1902. The Elepaio of Hawaii. *Auk* 19: 221–232.
MacCaughey, V. 1919. The Hawaiian Elepaio. *Auk* 36: 22–35.
Perkins, R. C. L. 1903. Part IV. Vertebrata. *In* Sharpe (ed.), *Fauna Hawaiiensis.* University Press: Cambridge.
Pratt, H. D. 1979. *A Systematic Analysis of the Endemic Avifauna of the Hawaiian Islands.* Unpubl. Ph.D. thesis, Louisiana State University, Baton Rouge.
Rothschild, W. 1893–1900. *The Avifauna of Laysan and the Neighbouring Islands with a Complete History to Date of the Birds of the Hawaiian Possessions.* R. H. Porter: London.
Sclater, P. L. 1885. On the muscicapine genus *Chasiempis. Ibis.* Ser. 5 (3): 17–19, Plate I.
Smithe, F. B. 1975. Naturalist's color guide. *Amer Mus. Nat. Hist,* New York.
Stejneger, L. 1887. Birds of Kauai Island, Hawaiian Archipelago, collected by Mr. Valdemar Knudsen, with descriptions of new species. *Proc. U.S. Nat. Mus.* 10: 75–102.
van Riper, C., Scott, J. M. & Woodside, D. M. 1978. Distribution and abundance patterns of the Palila on Mauna Kea, Hawaii. *Auk* 95: 518–527.
Wilson, S. B. & Evans, A. H. 1890–99. *Aves Hawaiiensis: the Birds of the Sandwich Islands.* R. H. Porter: London.

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The correct name and authorship for Wallace's Standard Wing (Passeriformes, Paradiseidae)

by David K. McAlpine

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The modern standard works on the birds of paradise (Gilliard 1969, Cooper & Forshaw 1977) give the name and authorship of Wallace's Standard Wing as *Semioptera wallacei* Gould, and Gilliard further (p. 126) attributes the epithet *wallacei* to "Gould 1859, *Birds Australia Suppl.,* pl. 11 and text".

Semioptera wallacei appears on pl. 52, not pl. 11, of the cited work by Gould in the sequence in which it was to be finally bound. Gould's supplement was issued in 5 parts over the period 1851-1869. Pl. 52 was originally published in part 3 which appeared in September 1859, but the plate number 52 was apparently not designated until 1869 when advice on the sequence for binding the previously issued plates was given with part 5.

Gould did not propose *S. wallacei* as a new species but referred to and quoted from an earlier published note by Gray (June 1859) in the proceedings of a meeting of the Zoological Society of London held on 22 March 1859. Herein Gray gave some descriptive information on the bird, derived from a sketch sent by A. R. Wallace with an accompanying letter marked "Batchian, Moluccas, Oct 29, 1858", and proposed the specific name *Paradisea wallacii* (sic) and the subgeneric name *Semioptera.*

Similar brief accounts of this Zoological Society meeting appeared even earlier in *Ibis* Ser. 1 (1): 210 (April 1859) and in The Literary Gazette No. 39 (New Series): 406 (26 March 1859). As the Literary Gazette report includes the first publication of both subgeneric and specific names I quote the passage relating to the new bird of paradise in full:—

"Mr. S. Stephens read an extract from a letter received by him from Mr. A. R. Wallace, dated Batchian, Moluccas, October 29, 1858, in which Mr. Wallace stated that he had the finest and most wonderful bird in the islands – a new bird of Paradise, of a new genus, quite unlike anything yet known. Mr. Wallace enclosed a rough sketch of the bird. Mr. G. R. Gray having had the above sketch placed in his hands for examination and comparison with the other known species of *Paradiseae,* agreed with Mr. Wallace that it is an entirely new form, differing from all its congeners, approaching most nearly to the king bird of Paradise, but in place of the lengthened caudal appendages, it has springing from the lesser coverts of each wing two long shafts, each being webbed with white on each side at the apex. The possession of these peculiar winged standards induced Mr. G. R. Gray to propose the subgeneric name of *Semeioptera,* and he further added the provisional specific name of *Wallacei,* in commemoration of the indefatigable energy Mr. Wallace had hitherto shown in the advancement of ornithological knowledge."

It is now apparent that the original spellings are "*Wallacei*" for one of the "species of *Paradiseae*" (i.e. the species was placed in the genus *Paradisea*, here rendered in the plural to indicate the species collectively) and *Semeioptera* for the subgenus, and that the authorship of both is to be attributed to Gray (International Code of Zoological Nomenclature, Art. 50 (a)). Because of the inclusion of descriptive statements the names cannot be dismissed as *nomina nuda,* though the publication has been generally ignored.

The species must bear the name *Semeioptera wallacei* (Gray). The slight alteration in spelling should cause little inconvenience and is a better transliteration from the Greek for standard-wing. The alternative spelling *Semioptera* is liable to misinterpretation as half-wing. The spellings *Semioptera* for the generic name and *wallacii* or *wallaceii* for the species epithet are incorrect subsequent spellings as defined by the International Code (Articles 32 and 33).

The generic name *Paradisea* Linné, 1758, has been commonly given as *Paradisaea* in modern literature. According to Neave (1940), who may have influenced other workers, the spelling *Paradisaea* dates from 1758, while *Paradisea* dates from Linné 1766. Iredale (1948: 175) has correctly pointed out that in the tenth edition of *Systema naturae*, Linné (1758) used the spellings *Paradisea* on p. 83 and *Paradisaea* on p. 110. It is thus a case of multiple original spellings and the spelling adopted by the first reviser is therefore to

be used. In the twelfth edition of *Systema Naturae*, Linné (1766: 117, 166) consistently used the spelling *Paradisea* and this spelling is to be accepted as correct. The family name based on this type-genus should be spelled Paradiseidae.

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References:
Cooper, W. T. & Forshaw, J. M. 1977. *The Birds of Paradise and Bower Birds.* Collins: Sydney.
Gilliard, E. T. 1969. *Birds of Paradise and Bower Birds.* Weidenfeld and Nicolson: London.
Gould, J. 1859 (Sept.) *The Birds of Australia.* Supplement 3: pl. 52 with text.
Gray, G. R. 1859a (March 26). Zoological Society (report of meeting). *Lit. Gaz.* 39 (New Series): 406.
— 1859b (April). (Footnote p. 210.) In XXII. – Letters, extracts . . . &c. *Ibis* Ser. 1(1): 206–212.
— 1859c (June). *In* (report of meeting) March 22nd, 1859. *Proc. Zool. Soc. Lond.* 27: 128–130.
Iredale, T. 1948. A check list of the birds of paradise and bower birds. *Aust. Zool.* 11: 161–189.
Linné, C. 1758. *Systema Naturae per Regna Tria Naturae* (10th ed.) 1.
— 1766. *Ibid.* (12th ed.) 1.
Neave, S. A. 1940. *Nomenclator Zoologicus,* 3. Zoological Society, London.

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Sula leucogaster and other species in the Iles Mitsios, Madagascar

by N. V. C. Polunin

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The literature contains no mention of the Iles Mitsios in northwest Madagascar as an important locality for sea-birds in the western Indian Ocean (Milon *et al.* 1973, Feare 1978, C. Jouanin, pers. comm.), but in July 1973 while visiting these islands on board the yacht 'Marimba' I found two rocky islets to be inhabited by many sea-birds, most notable amongst which was a nesting population of the Brown Booby *Sula leucogaster*. These islands are therefore the only major sea-bird locality recorded in coastal waters off Madagascar. A set of colour transparencies of the islands and their bird populations is deposited at the Museum of Zoology, University of Cambridge.

I visited the two islets, Behangovo (centred at 48° 30′ 33″ E, 13° 00′ 01″ S; maximum height 61 m) and Betalinjona (centred at 48° 30′ 00″ E, 12° 59′ 04″ S; maximum height 74 m) on 6 July 1973; these, together with two other rocks (Antsoha and Betaniazo) which are not colonised by sea-birds, constitute 'Les Quatres Frères', a group which lies some 32 km northeast of Nossi Bé and approximately 35 km west of Port St. Louis, one of the nearest points on the mainland. Neither of the sea-bird colonised islets are easily accessible, for they are climbable only by a single tortuous gulley each on their northern sides. Behangovo was visited on the morning of 6 July 1973, and Betalinjona on the afternoon of the same day.

Sula leucogaster was present and nesting in large numbers on both islets; eggs, and naked and downy young were seen. Approximately 100 adults were estimated to be present on Behangovo and some 250 on Betalinjona. On Betalinjona adults were also seen roosting on narrow ledges under the large overhang on the northern aspect of the islet, together with some 50 Common Noddy *Anous stolidus*. The nearest reported population of *Sula leucogaster* is on the Iles Glorieuses, but this has apparently become extinct in recent years (Benson *et al.* 1975).

Both *Fregata ariel* and *F. minor* were present on the islets. A single large frigate was seen in the morning over Behangovo, but large numbers were observed gathering over the islet in the evening. Males of both *F. ariel* and *F. minor* were sighted at Betalinjona, and the numbers gathering over the rock in the evening were estimated at over 100 individuals; no young were seen and none of the males showed obvious gular sacs.

The other conspicuous sea-bird at the rocks was *Phaethon lepturus*. There were 3 sightings at Behangovo, and at least one nest was occupied there at that time. At Betalinjona there were several sightings of flying birds, and there were nests present on the steep southern side of the islet. These records represent the first definite account of *Sula leucogaster* and of a large roosting population of *Fregata* spp. in coastal waters of Madagascar; *Phaethon lepturus* and *Anous stolidus* have been reported previously to nest in the region (Milon *et al.* 1973).

A few land-birds were also present on these islets. There were c. 30 sightings of *Foudia madagascariensis*. A single youngish individual of *Dicrurus forficatus* was seen on Betalinjona, and at least 2 individuals of *Cisticola cherina* were present at Behangovo. Two individual *Dryolimnas cuvieri* were seen at Betalinjona, a dry rocky and sparsely vegetated habitat which does not seem to be typical of this species elsewhere in the region (Milon *et al.* 1973, Benson *et al.* 1976). Two individuals, evidently a pair, of the common *Falco newtoni* were observed on Behangovo.

Sula leucogaster has probably survived on Behangovo and Betalinjona because of the inaccessibility of these islets, but other factors, such as local taboos which are known to have existed on islands to the South until recent times (L. A. Mauge, pers. comm.) could have been important.

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References:

Benson, C. W., Beamish, H. H., Jouanin, C., Salvan, J. and Watson, G. E. 1975. The birds of the Iles Glorieuses. *Atoll Res. Bull.* 176: 1–34.

Benson, C. W., Colebrook-Robjent, J. F. R. & Williams, A. 1976. Contribution a l'ornithologie de Madagascar. *L'Oiseau et R.F.O.* 46: 103–134.

Feare, C. J. 1978. The decline of booby (Sulidae) populations in the western Indian ocean. *Biol. Conserv.* 14: 295–305.

Milon, P., Petter, J.-J. & Randrianasolo, G. 1973. Oiseaux. Faune de Madagascar. ORSTOM, Tananarive and CNRS, Paris.

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Picathartes—another West African forest relict with probable Asian affinities

by Storrs L. Olson

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Sibley (1973) has reviewed the history of classification of *Picathartes,* a distinctive passerine genus consisting of 2 well-differentiated species, *P. oreas* and *P. gymnocephalus,* confined to the primary forests of western Africa. On the basis of additional egg-white protein data he reaffirmed his own previous conclusions (Sibley 1970), as well as those of Amadon (1943) and Delacour & Amadon (1951), that *Picathartes* belongs in the large and ill-defined family Timaliidae and not with the Corvidae or Sturnidae as had sometimes been suggested previously. Accepting this, the problem remains of determining the nearest relative of *Picathartes* within the Timaliidae.

Although he made note of Serle's (1952) observation that *Picathartes* bears a resemblance to the southeast Asian and Indonesian species *Eupetes macrocerus*, Sibley (1973: 24) considered that this similarity was "almost certainly the result of convergence". Serle evidently had little confidence in his own insight and maintained that *Picathartes* was nevertheless probably related to the Corvidae. The egg-white protein data prompted Sibley (1973) to propose a particularly close relationship between *Picathartes* and the African timaliid *Turdoides*. It would seem that such a conclusion was influenced by zoogeographic considerations and the fact that the only genera of Timaliidae analyzed by Sibley were *Turdoides, Trichastoma* and *Pomatostomus*—a sample which must be deemed inadequate for a proper assessment of relationships within this complex and quite possibly unnatural group of birds. (One may note in addition, that Sibley's egg-white protein results have recently been questioned on purely methodological grounds—Brush 1979.)

I believe that Serle was probably more correct than he realized in proposing a relationship between *Picathartes* and *Eupetes*. Currently placed in the genus *Eupetes* are the New Guinean species sometimes recognized as constituting a separate genus, *Ptilorrhoa;* for the present comparisons, however, I shall consider only *Eupetes macrocerus,* which is larger and more closely resembles *Picathartes* than do the New Guinean birds. *Eupetes macrocerus* and *Picathartes* have in common a similar build; long, strong tarsi; a long, well-developed tail; lax, decomposed plumage; and a long, slender neck. As in *Picathartes,* part of the head pattern in *Eupetes macrocerus* consists of bare skin, although this is a more restricted patch which extends along the sides of the neck. The long, slender bill of *Eupetes macrocerus* is more closely approximated by that of *Picathartes oreas* than by *P. gymnocephala,* and the pattern of the short, black velutinous feathers of the lores and cheeks of *E. macrocerus* is similar to the pattern of the dark portions of bare skin on the head of *P. oreas*. Both *Eupetes macrocerus* and the 2 species of *Picathartes* are terrestrial birds of primary forest and are noted for their speed and agility on the forest floor. This contrasts markedly with *Turdoides,* which is an arboreal, shrub-dwelling bird of more arid upland savannas. Furthermore, there is absolutely no resemblance in external appearance between *Turdoides* and *Picathartes*. *Turdoides* lacks any bare areas on the head or neck, the bill shape is different,

the tarsi and tail are proportionately shorter, and there is no similarity between them in either plumage texture or pattern. The plumage pattern in both *Picathartes* and *Eupetes* consists of areas of uniform colouration without squamation or streaks as in most species of *Turdoides*.

The fact that the ranges of *Picathartes* and *Eupetes* are widely separated in west Africa and southeast Asia, respectively, in no way militates against a presumption of relationship between these genera. Elsewhere (Olson 1973), I have pointed out several diverse groups of birds and mammals that show similar patterns of distribution. Some of the more striking examples among birds are as follows (African forms listed first in each pair): *Tigriornis—Zonerodias, Afropavo—Pavo, Sarothrura—Rallicula, Phodilus prigoginei—P. badius, Verrauxia—Sasia, Pseudocalyptomena*—Asian broadbills, *Pseudochelidon eurystomina—P. sirintarae*. These discontinuous patterns probably have their origins in Quaternary environmental deterioration of formerly forested areas between Africa and southeast Asia. It probably has not been often enough emphasized that many of the endemic elements of the West African forest fauna are relicts of once more generally distributed Old World groups, related survivors of which often persist in Southeast Asia as well.

Although there seems to be no reason to contradict the placement of *Picathartes* in the Timaliidae, the suggestion that it is closely related to *Turdoides* is here considered unlikely. A closer relationship of *Picathartes* to *Eupetes* seems more reasonable on morphological grounds and is in accord with zoogeographic patterns observed in other avian taxa. This, of course, remains to be substantiated by detailed anatomical and behavioural studies, knowledge of *Eupetes* being particularly deficient because the genus has evidently excited less admiration and interest than has *Picathartes*.

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References:

Amadon, D. 1943. The genera of starlings and their relationships. *Amer. Mus. Novit.* 1247: 1–16.

Brush, A. H. 1979. Comparison of egg-white proteins: effect of electrophoretic conditions. *Biochemical Systematics and Ecology*. 7: 155–165.

Delacour, J. & Amadon, D. 1951. The systematic position of *Picathartes*. *Ibis* 93: 60–62.

Olson, S. L. 1973. A classification of the Rallidae. *Wilson Bull.* 85: 381–416.

Serle, W. 1952. The affinities of the genus *Picathartes* Lesson. *Bull. Brit. Orn. Cl.* 72: 2–6.

Sibley, C. G. 1970. A comparative study of the egg-white proteins of passerine birds. *Bull. Peabody Mus. Nat. Hist.* 32: 1–131.

— 1973. The relationships of *Picathartes*. *Bull. Brit. Orn. Cl.* 93: 23–25.

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IN BRIEF

Allopreening by the Yellow-casqued Hornbill *Ceratogymna elata*

Hornbills inhabiting the canopy of closed tropical forest are difficult to observe. As a result, almost nothing is known of hornbill courtship behaviour or pair relations prior to actual nesting activity. On the morning of 3 February 1979, I observed allopreening by a female Yellow-casqued Hornbill *Ceratogymna elata* of a male in primary rain forest bordering Lac Tissongo in the Reserve de Fauna de Douala-Edéa, c. 35 km SW of Edéa, Cameroun. I had been observing visitors to a fruiting vine of *Ficus* sp., and at least one pair of *C. elata* was among the regular visitors. At 0820, a pair landed in the crown of the 25 m tall leguminous tree supporting the *Ficus* vine, perching about 2 m from one another. Each beganto self-preen, attending primarily to wing and breast feathers. After less than one minute of self-preening, the female approached the male and began to preen him while he continued to self-preen. The male bent his head forward, spreading the nape feathers. The female preened the spread feathers for 15 sec. Then, each bird self-preened for 30 sec. The male continued to self-preen as the female preened the side of his head nearest to her, then preened body coverts beneath the anterior edge of the male's wing on her near side. The male raised this wing slightly, and the female continued to preen beneath the male's wing for 30 sec. This was followed by 60 sec of self-preening by each bird, immediately after which both birds flew, the female following the male in flight. Males leading the females in flight of pairs of *C. elata* was commonly seen by Allen (1930).

Little has been published describing courtship or presumed courtship behaviour in hornbills. Ranger (1951) included comments on pre-copulatory behaviour of the Crowned Hornbill *Tockus alboterminatus australis,* but did not mention allopreening. To my knowledge, nothing has been published on courtship behaviour of *C. elata*. Frequent sightings by myself and R. B. Payne of at least one pair (probably several pairs), but of no larger groups, of *F. elata* at Lac Tissongo from 28 January to 7 February 1979 suggest an early phase of breeding activity at that time. Mackworth-Praed & Grant (1970) note no records of breeding, nests, or eggs for *C. elata,* although they state that breeding probably occurs from December to April.

Ackowledgments: Travel funds were provided by NSF grant BNS 78–03178 to R. B. Payne. I thank D. McKey for the invitation to visit the Field Research Centre at Lac Tissongo and the brothers Collins for transport by dugout canoe.

References:
Allen, G. 1930. *The Birds of Liberia*. In *The African Republic of Liberia and the Belgian Congo* (R. P. Strong, Ed.). Harvard Univ. Press: Cambridge.
Mackworth-Praed, C. W. & Grant, C. H. B. 1970. *Birds of West Central and Western Africa.* Vol. 1. Longman, London.
Ranger, G. 1951. Life of the Crowned Hornbill (Part IV). *Ostrich* 22: 77–93.

15 May 1979 R. Breitwisch

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Scientific nomenclature and the style and lay-out of papers and of References should conform with usage in this or recent issues of the *Bulletin*, unless a departure is explained and justified. Photographic illustrations, although welcome, can only be accepted if the contributor is willing to pay for their reproduction.

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Edited by

Dr. J. F. MONK

Volume 99 No. 4 December 1979

ANNUAL GENERAL MEETING

The eighty-eighth Annual General Meeting of the British Ornithologists' Club will be held in the Senior Common Room, South Side, Imperial College, Prince's Gardens, London S.W.7, at 6 p.m. on Tuesday 13 May 1980.

AGENDA

1. Minutes of the last Annual General Meeting (*Bull. Brit. Orn. Cl.* 99:41).
2. Report of the Committee and Accounts for 1979.
3. The *Bulletin*.
4. Election of Officers. The Committee proposes that:
   (a) Dr. G. Beven be elected Chairman *vice* Mr. P. Hogg, who retires on completion of his term of office and is ineligible for re-election.
   (b) Mr. D. R. Calder be elected Vice-Chairman *vice* Dr. G. Beven, who retires on completion of his term of office and is ineligible for re-election.
   (c) Dr. J. F. Monk be re-elected Editor.
   (d) Mrs. D. M. Bradley be re-elected Hon. Treasurer.
   (e) Mr. R. E. F. Peal be re-elected Hon. Secretary.
   (f) Mr. R. A. N. Croucher be elected a member of the Committee *vice* Mr. B. Gray, who retired by rotation.
5. Any other business of which notice shall have been given in accordance with Rule (7).

By Order of the Committee
RONALD F. PEAL
Honorary Secretary.

NOTE. As the Bulletin Vol. 100 No. 1 will be a special enlarged number consisting entirely of invited papers, the Report of the Committee and Accounts for 1979 will be published in Vol. 100 No. 2. Members who wish to be sent copies of the Report and Accounts before the Annual General Meeting should inform the Hon. Secretary.

FORTHCOMING MEETINGS

Tuesday 15 January 1980 at 6.30 p.m. for 7 p.m. at the Senior Common Room, South Side, Imperial College, Prince's Gardens, S.W.7. Dr. C. J. Bibby on *Ecological aspects of migration* Those wishing to attend should send a cheque for £4.30 a person to the Hon. Secretary at 2 Chestnut Lane, Sevenoaks, Kent TN13 3AR (telephone Sevenoaks 50313) to arrive not later than first post on Thursday 10 January. A slip for ready use by those wishing to attend this meeting was enclosed in the last *Bulletin* (Vol. 99 (3).)

Tuesday 4 March 1980 at 6.30 p.m. for 7 p.m. at the same venue as above, Dr. C. H. Fry on *Kingfishers*. Those wishing to attend should send a cheque for £4.40 a person together with their acceptance on the enclosed slip to the Hon. Secretary at the same address as above, to arrive not later than first post on Thursday 28 February.

Tuesday 15 April 1980 at Imperial College, *a special Meeting to mark the centennial volume* of the *Bulletin*. Important guests will be invited and films will be shown. Members are asked to make a note of this Meeting: full information will be published in the next *Bulletin* (Vol 100 (1).)

Tuesday 13 May 1980 at Imperial College. Dr. Leslie Brown on *Flamingos and Pelicans on the Rift Valley Lakes*.

GIFTS OR OFFERS FOR SALE OF UNWANTED BACK NUMBERS OF THE BULLETIN ARE VERY WELCOME.

Bulletin of the BRITISH ORNITHOLOGISTS' CLUB

Vol. 99 No. 4 Published: 20 December 1979

The seven hundred and twenty second Meeting of the Club was held in the Senior Common Room, South Side, Imperial College, London, S.W.7 on Tuesday, 18 September 1979 at 7 p.m. The attendance was 20 Members and 6 guests.

Members present were: P. HOGG (*Chairman*), Miss I. P. BARCLAY-SMITH, Major N. A. G. H. BEAL, Dr. G. BEVEN, Miss G. M. BOND, Mrs. D. M. BRADLEY, Commander M. B. CASEMENT, R.N., S. CRAMP, R. A. N. CROUCHER, Professor J. H. ELGOOD, D. J. FISHER, B. GRAY, D. GRIFFIN, Dr. R. M. HARWIN, Dr. J. F. MONK, P. J. OLIVER, J. G. PARKER, R. E. F. PEAL, S. A. H. STATHAM and K. V. THOMPSON.

Guests present were: E. F. J. Garcia (speaker), Miss M. Barry, Miss M. Collard, M. E. K. Gore, Dr. Amicia Melland and M. Riddell.

The speaker was Mr. E. F. J. Garcia, who gave an illustrated address of great interest upon "The Birds of Gibraltar". He explained the various habitats there and gave information about the breeding birds. He also discussed raptor migration across the Straits and stated that surveys co-ordinated with observers in Spain suggested that Gibraltar was not on the main route for these birds passing between Iberia and North Africa.

The seven hundred and twenty third Meeting of the Club was held in the Senior Common Room, South Side, Imperial College, London, S.W.7 on Tuesday, 20 November 1979 at 7 p.m. The attendance was 30 Members and 16 guests.

Members present were: Dr. G. BEVEN (*Chairman*), Miss I. P. BARCLAY-SMITH, Major N. A. G. H. BEAL, K. F. BETTON, Mrs. D. M. BRADLEY, R. D. CHANCELLOR, Squadron-Leader D. ST. J. COURT-SMITH, S. CRAMP, R. A. N. CROUCHER, Professor J. H. ELGOOD, Sir HUGH ELLIOTT, G. D. FIELD, D. J. FISHER, A. GIBBS, B. GRAY, A. J. HOLCOMBE, Rev. G. K. McCULLOCH, I. G. MANKLOW, C. F. MANN, Dr. J. F. MONK, P. J. OLIVER, J. G. PARKER, R. E. F. PEAL, R. C. PRICE, P. S. REDMAN, S. A. H. STATHAM, K. V. THOMPSON, A. VITTERY, C. E. WHEELER and C. R. WOOD.

Guests present were: M. E. K. Gore (speaker), Miss M. Barry, Mr. and Mrs. E. Cawkell, Miss M. Collard, Miss H. Fisher, Mrs. M. E. K. Gore, G. Howard, R. A. Hume, G. P. McCulloch, Mrs. I. McCulloch, Miss I. E. McCulloch, Miss E. V. Pilcher, Mr. and Mrs. G. H. Searle and Mrs. B. W. Vittery.

Mr. M. E. K. Gore spoke on "The Birds of The Gambia". He described first the topography and habitats, then the avifauna of the area. He illustrated his address with his own excellent colour slides, including many of the 484 bird species recorded there, especially of the 193 species known and 52 suspected to have bred in The Gambia.

Notes on some Brazilian Birds

by Helmut Sick

Received 6 April 1979

I present here some selected records from Brazil, dealing with the following topics: (1) MUTATION: *Jabiru mycteria;* (2) NEW FOR BRAZIL: *Diomedea chrysostoma*, *Vultur gryphus*, *Laterallus xenopterus*, *Larus delawarensis*, *Lobipes fulicarius* and *Pyrrhura rupicola;* (3) EXTENSION AND CORRECTION OF RANGE: *Geranoaetus melanoleucus*, *Buteo swainsoni*, *Sterna sandvicensis acuflavida*, *Caprimulgus l. longirostris*, *Baillonius bailloni*, *Berlepschia rikeri* and *Passer domesticus*: (4) RARE OR LITTLE KNOWN: *Crax fasciolata pinima* and *Crax fasciolata grayi*,

Phaethornis nigrirostris, *Nemosia rourei* and *Emberizoides ypiranganus;* (5) *Hybridization;* in Pipridae and Icteridae x Carduelinae.

The basic literature on distribution is: O. Pinto (1938, Cat. I, Rev. Mus. Paul. XXII, 566 pp, new edition 1978, São Paulo, 446 pp.; idem 1944, Cat. II, 700 pp.), M. de Schauensee (1966, *Species of Birds*, 577 pp., and 1970, *Guide to the Birds of South America*, 470 pp.), and the author's forthcoming book *Aves do Brasil, Introducao a Ornitologia Brasileira.*

Jabiru mycteria Jabiru. In the Pantanal of Mato Grosso (Transpantaneira, 40 km from Poconé) unusually coloured specimens of Jabiru sometimes appear which have the bare head and neck entirely red; there is also some red on the commissure, and the legs are also red. Normally the head, neck, bill and legs are black, and only the base of the neck is red.

The red-headed Jabiru can be found in flocks of normally coloured Jabirus, Wood-Storks, Great Egrets, White-necked Herons, etc. They were well documented in colour-slides by Arne Sucksdorff, Cuiabá, in 1975.

Diomedea chrysostoma Grey-headed Albatross. Observed by C. C. Olrog off the Brazilian coast (São Paulo to Santa Catarina): on 3 May 1954 2 adults and 2 juveniles, together with *Diomedea melanophris*, following the ship (25°S, 40°W); on 24 May 1958 one adult (27°S, 45°W) and on 25 May 1958 one adult and 2 juveniles (24°S, 38°W). Apparently the first record from Brazil.

Vultur gryphus Andean Condor. The Rio Jaurú, western Mato Grosso, is visited by condors in the beginning of the dry season (May/June), as first noted by Arne Sucksdorff, Cuiabá, in 1974. There is an "Ilha dos urubus" in which the current of the river has hollowed out a bay where the water swirls round depositing carcases of cattle on the beach. Black and King Vultures come too. The condor is new for the list of Brazilian birds.

Lobipes fulicarius. Red Phalarope. One specimen in winter plumage, collected by Paul Roth near Aripaunã, Mato Grosso, on 11 March 1979, is deposited in the Museu Nacional, Rio de Janeiro. The first record for Brazil.

Geranoaetus melanoleucus Black-chested Buzzard Eagle. This eagle, recorded up to now only in southern Brazil (up to São Paulo), was found by us in Minas Gerais (Serra do Caraça, July 1974), Bahia (Raso da Catarina, Dec 1978; Rio Sapão, Aug 1976) and Piauí (Oct 1977). Apparently the species is resident in all these places.

Buteo swainsoni Swainson's Hawk. Records of this North American hawk in Brazil are scarce. Our first specimen was collected on 3 Nov 1946 on the Rio das Mortes, Mato Grosso, an area where the species, which migrates through the middle of the continent to the Argentinian pampa, was to be expected. It was a surprise that in November 1974 newspapers in São Paulo published some excellent photographs showing Swainson's Hawks (referred to as Peregrines) in flight around the Campos Elisios, in the centre of the city.

Crax fasciolata pinima and Crax fasciolata grayi Bare-faced Curassow. In November 1977 we realized that the rare east Amazonian race *pinima* occurred regularly in the still extensive Pindaré forest in western Maranhão, but was endangered by the construction of a railroad. It lives there together with the Amazonian Razor-billed Curassow *Mitu m. tuberosa.*

In the interior of eastern Pará (e.g. Ourem) we found several specimens of *pinima* in captivity. Pedro Nardelli, outstanding aviculturist in Nilópolis, Rio de Janeiro, has had live specimens of *pinima* at least since 1975. At the same time Nardelli acquired *Crax fasciolata grayi,* bought in Cuiabá, Mato Grosso, said to come from Bolivia. We have still to deal in more detail with the male of *grayi*, apparently not yet described (see Delacour & Amadon 1973, *Curassows and Related Birds:*) 224); it has a light yellow abdomen, not a white one as other *fasciolata* males.

Lateralllus xenopterus Rufous-faced Crake. One unsexed specimen, 7 July 1978, Parque Nacional Brasília, D.F. Wing 92, tail 52, culmen 16, tarsus 27, middle toe with claw 30.5 mm. Weight 53 g, total length 19.4 cm. There are no indications about the fresh colour of bill, feet, or iris; in the dried skin the bill is black, becoming light horn at the very tip, and the feet are dark brown.

The species seems to be known only from the type, a female from Paraguay. The description by Conover (1934, *Auk* 51: 365-366) corresponds well with the specimen from Brasilia. The tail, lacking in the type, and its coverts are much longer and wider than in other *Laterallus*. The tail is an important structural character of *xenopterus,* different from other *Laterallus,* while other structural peculiarities of *xenopterus,* as pointed out already by Conover, are the stouter bill and the shorter tarsus. The tail and its coverts are black with a faint brown sheen, similar to the secondaries; some of the undertail coverts have a trace of a whitish pattern.

As regards colouration, a striking characteristic of *xenopterus* is the broad white barring of the upper wing coverts and scapulars (unbarred in the similar *melanophaius* and *leucopyrrhus*). The top of the head, sides of the face, and top and sides of the neck are dark rufous in *xenopterus,* reminiscent of *L. leucopyrrhus.* The buffy ochraceous colour of the foreneck, chest and breast of *xenopterus* is similar in some specimens of *L. melanophaius* (e.g. from Espirito Santo). The chin of our *xenopterus* is white, the lores are blackish.

This rail was caught by Rick Hansen, working for IBDF, while snap-trapping small mammals in an area of homogeneous bunchgrass with standing water; when I visited the place in December it was dry. The area is bordered by gallery forest on one side and cerrado on the other.

I thank Rick Hansen, who realized the importance of his finding, for sending me the bird for identification at the Museu Nacional, Rio, where the specimen is now deposited.

Larus delawarensis Ring-billed Gull. One specimen near Tefé, Amazonas, 23 Nov 1968; banded 5 months before on the Canada–U.S.A. border. The gull was obtained by Raimundo Almeida from a large flock of gulls. He noted that it was "obviously different from the rest of the gulls, both in appearance and behaviour". This seems to be the first record from continental South America. The species is known from Trinidad (sight records).

Sterna sandvicensis acuflavida Sandwich Tern. One record from Rio Grande do Norte, 5 Aug 1966, a specimen banded on the coast of Mississippi, U.S.A., July 1964. This is up to now the only certain Brazilian record of *acuflavida,* the North American race. All other records of Sandwich Terns from Brazil about which I have obtained detailed information belong to the

South American breeding race *eurygnatha*. Of special interest is the material of Natterer, examined at my request by K. H. Voous (1977, *Bull. B.O.C.* 97: 42-44), which also proved to be *eurygnatha*.

Pyrrhura rupicola subsp. Rock Parakeet. One female, Fazenda Campo Lindo, Rio Branco, Acre, 24 May 1968, coll. J. Hidasi; Museu Nacional, Rio. This is the specimen de Schauensee (1970: 102) refers to. The first record from Brazil.

Caprimulgus l. longirostris Band-winged Nightjar. It is noteworthy that this nightjar, which in the northern part of South America is generally a mountain bird (I observed it, e.g. at 4000 m in the Columbian Andes), has colonized during the last 25 years the city of Rio de Janeiro, situated at sea level in the tropics, where it lives on buildings.

In other tropical areas of Brazil it is a mountain bird, as I realised in 1941 (Sick 1959, *Bol. Mus. Nac. Rio, Zool:* 204). Recently we found the species at sea level in Rio Grande do Sul (Belton 1978, *Auk* 95: 414), where the fauna is similar to that of mountain areas north of the tropic of Capricorn, a rule formulated already by Humboldt. It was a surprise to record this nightjar also in northern Bahia, in a canyon-like valley of the Raso da Catarina (340 m, January 1979). The ability to shift habitat preference is a character of the most successful colonizers (Mayr 1965: 41, *The Genetics of Colonizing Birds,* Acad. Press: New York).

Phaethornis nigrirostris Black-billed Hermit. Few people have had the opportunity to see anything of the new species of hummingbird described in recent years by A. Ruschi. During my trip with R. S. Ridgely through eastern Brazil in 1977 we had an excellent opportunity of observing *Phaethornis nigrirostris* in the Reserva Nova Lombardia, Espirito Santo. It is easily distinguishable by its entirely black bill which, in consequence of this colour, appears very thick.

Baillonius bailloni Saffron Toucanet. This toucanet, typical of the mountains of southeastern Brazil (Itatiaia, etc.), also occurs in Pernambuco, northeastern Brazil. The first indication of its occurrence there was a specimen which I found in 1967 in captivity in Recife, coming from Serra Negra, Município Floresta. Galileu Coelho saw the species there again in 1971, but not in 1976/77. In 1978 some specimens were offered for sale in the market of Recife.

Berlepschia rickeri Point-tailed Palmcreeper. The occurrence of this furnariid, rare in collections, is strictly dependent on the two *Mauritia* palms, *vinifera* in Central Brazil and *flexuosa* in the Amazon. One must know the voice of the bird to find it. On the southern border of its range I recorded it on the upper Xingú, Mato Grosso (Rio Sete de Setembro, 1952) and on the Araguaia, Goiás (Aragarças, 1953). I have also found it in northern Bahia (Rio Sapão, 1974) and Piauí (Correntes and Uruçuí 1977).

Chiroxiphia caudata Blue Manakin and Antilophia galeata Helmeted Manakin. Parkes (1961, *Condor* 63: 345-350) admits three hybrids in Pipridae: *Manacus manacus* x (probably) *Pipra erythrocephala, Teleonema filicauda* x (probably) *Manacus manacus* and *Pipra aureola* x *Heterocercus linteatus*. Two other available specimens (skins) may be of hybrid origin too.

In Brazil the phenomenon of hybridization among manakins came to

light in birds sold as cagebirds, which aroused the interest of Armando Assumpção, an aviculturist, and Werner Bokermann of the Zoological Park, São Paulo. In 1967 Mr. Assumpção already knew of four such specimens, captured over a range of 600 km. The birds proved to be hybrids of *Chiroxiphia caudata* x *Antilophia galeata*, two manakins which meet in gallery forest in the interior of the State of São Paulo, e.g. near Pirassununga.

Knowing that Paulo Bührnheim, Campinas, who had such a bird for some time in captivity, was studying the problem, I did not interfere. In 1978, however, I took the opportunity to visit one of the forests near Campinas where such hybrids might be found, as both *Chiroxiphia caudata* and *Antilophia galeata* occur there. On 5 Dec, in the forest of the Fazenda Genebra near Campinas, P. Bührnheim and I located a manakin calling, sounding like *Chiroxiphia* or *Antilophia;* the character of the voice was not clear-cut. Later I twice had a perfect view of a wonderful hybrid manakin. From the front, the bird appeared like an adult male *Antilophia,* but its frontal crest was short and the central tail feathers were pointed and a little bit protruding, reminiscent of *Chiroxiphia.* From behind, the bird appeared totally different from *Antilophia,* but similar to an adult male *Chiroxiphia:* its back was entirely a clear bluish-yellow, suggesting a faded adult *Chiroxiphia* male. This is the first observation of a manakin hybrid alive in nature. All records of hybrids of Pipridae have been based, up to now, only on skins or cage birds.

The reason for the hybridization of *Chiroxiphia* and *Antilophia* lies probably in a shortage of males of *Antilophia,* due to persistent capturing (cf. also Fringillidae: Sick 1963, *Proc. XIII Intern. Ornithol. Congress:* 161-170). As a result, *Antilophia* females probably have difficulty in finding males of their species, especially as the sex ratio in *Antilophia* seems to be 1:1. In *Chiroxiphia caudata,* however, there is a surplus of males. Therefore "our" hybrids are probably crosses of *Chiroxiphia* males x *Antilophia* females.

Atticora melanoleuca Black-collared Swallow. For several years this conspicuous Amazonian swallow has been present at Foz do Iguaçú, Paraná, on the Iguaçú River, above the famous falls, seen, e.g., by Paul Roth on 3 July 1976 and later. It seems that this is a new settlement and not a transitory migration. In 1959 I did not record *Atticora* from Iguaçú.

Agelaius ruficapillus Chestnut-capped Blackbird. In the aviary of Mrs. Flávia Silveira Lobo, Rio de Janeiro, a male of this blackbird mated with 2 female canaries *Serinus canaria* and produced 7 offspring in 8 months. Five of the young died when 2-27 days old. One, similar to a canary but ill-proportioned, died at 8 months. One young, resembling a female *Agelaius ruficapillus,* survived well. It mated with a male canary and produced several clutches, from which 3 eggs hatched (newly hatched young were black as in *Agelaius*), proving the fertility of the icterid-cardueline hybrid. The relationship of the carduelines to other 9-primaried oscines (such as the Icteridae) is suggested by the electrophoretic patterns of their egg-white proteins (Sibley 1970, *Peabody Mus. Nat. Hist. Bull.* 32: 96).

Nemosia rourei Cherry-throated Tanager. Of this species, known only by the type from Muriaé, Minas Gerais, north bank of rio Paraiba, 1870 (I have seen the type in the Berlin Museum), I saw on 8 Aug 1941 in the region of Jatiboca, Espirito Santo, 900 m, a flock of 8 in the canopy of the forest. They were not associated with any other birds.

Emberizoides ypiranganus Lesser Grass-Finch. When I came first into the area of this recently rediscovered species, I easily found it by its voice, reminiscent of European warblers of the genus *Acrocephalus*, which it resembles also in habitat preference and behaviour. It is very different in all aspects of its life history from the common *Emberizoides herbicola*. I recorded the species in several places in Paraná and Santa Catarina (Oct 1969), and later in Rio Grande do Sul. It was known, at the time, only from São Paulo (Ypiranga).

At the same time, by coincidence, E. Eisenman began to take an interest in specimens of *E. ypiranganus* which the AMNH in New York had obtained from W. Partridge from Misiones, Argentina (Eisenmann & Short, MS). Short (1975, *Bull. Am. Mus. Nat. Hist.* 154: 320-321) mentions *ypiranganus* from Paraguay and neighbouring Argentina.

Passer domesticus House Sparrow. The penetration of the Amazon by the House Sparrow was discussed recently by Smith (1973, *Condor* 75: 242–243). R. S. Ridgely and I found it on 5 Dec 1977 160 km northeast of Belém, in Salinopolis (0° 37'S, 47° 20'W), a coastal locality with a very dry climate. A search in Belém (1°27' S, 48° 29'W) in 1977 in the Amazonian forest region was unsuccessful. The House-Sparrow was released in Belém about 1927 but disappeared (Sick 1957, *Vogelwelt* 78: 8). In northeastern Brazil we recorded the House Sparrow in November 1977 in several "new" places (see Sick 1971, *Arqu. Mus. Nac. Rio* 54: 113–121): in Piauí (Teresina) and Maranhão (Bacabal and Santa Ines).

It is surprising that the successful spread of the House Sparrow can be checked by the Shiny Cowbird *Molothrus bonariensis*, as reported from the interior of São Paulo (Rio Claro). The House Sparrow is generally not parasitised by the cowbird in Brazil.

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The Egg and Nest of the Bokikokiko *Acrocephalus aequinoctialis*

by Ralph W. Schreiber

Received 1 May 1979

While on Christmas Island (2°N, 157°W) between 5 and 22 March 1979, I found and collected many nests and collected the first known extant egg of the Bokikokiko or Line Island Warbler *Acrocephalus aequinoctialis*. This sylviid warbler is endemic to the Central Pacific Line Islands. Its taxonomic and population status was discussed by Clapp & King (1975), and Gallagher (1960) recorded notes on breeding biology. As noted by Child (1956) the Gilbertese refer to this bird as the 'Bokikokiko' rather than the 'Kokikokiko' used in most of the literature. I suggest the former should be the accepted common name.

The egg, which measures 21·21 × 14·54 mm, with an empty dry shell weight of 0·131 g, was found in a nest with a nestling estimated to be about 8 days old. The egg had solid material inside and was probably infertile: it is

Fig. 1. Nest of *Acrocephalus aequinoctialis* in *Messerschmidia argentea* on Christmas Island, Central Pacific Ocean.

Fig. 2. Adult *Acrocephalus aequinoctialis* with tail of either *Hemidactylus* sp. or *Lepidodactylus lugubris* (Gecko
to feed its nestlings.
Adult *Acrocephalus aequinoctialis* on perch near its nest in Beach Heliotrope *Messerschmidia argente*

now specimen number 108,033·1 in the Western Foundation of Vertebrate Zoology, Los Angeles, California. The egg is light greyish to pale green with brown, chocolate and dark grey spots, heaviest at the large end, and it is similar to the Marsh Warbler *Acrocephalus palustris* and Great Reed Warbler *A. arundinaceus* of Europe and less similar to the extinct Laysan Millerbird *A. familiaris* of Laysan Island, Pacific Ocean.

I discovered 15 nests, 3 of which contained nestlings during my visits. One clutch of 4 fledged on 19 March and the 2 and one young in the other nests were still present on 21 March. All the nests were located just below the canopy in three-or four-branch forks of mature Beach Heliotrope *Messerschmidia argentea*, and usually in the tallest, most mature forms with open branching areas below the canopy. Nests ranged in estimated height from 1·8 to 8·1 m (mean 5·3 m), with most in the 6 to 7 m range. In Table 1 are given the dimensions of 5 nests collected and Fig. 1 illustrates a nest in relation to the leaf clusters at the branch tips.

TABLE 1

Dimensions (mm) of nests of *Acrocephalus aequinoctialis*, Christmas Island, Central Pacific Ocean.

Height above ground (m)	Total depth of nest	Depth from nest cup rim to bottom of cup	Diameter of cup at rim	Diameter of total nest	Diameter of base branch	Diameter of support branches at rim
6·5	70	48	40×50	80×92	12	6–7–7
4·0	100	53	42×50	85×95	20	10–13–15
5·5	85	50	40×50	95×105	14	9–9–9
6·8*	110	55	49×64	140	25	14–16–18
6·2**	135	41	52×58	72×95	18	7–9–11

*Two nestlings present; cup off to one side; structure appears to have been used twice.
**Four nestlings fledged from nest; structure appears to have been used at least twice.

Nests seem to be built in 2 forms, either a relatively simple cup or with a deeper, more complicated base below the nest cup. Since the 3 occupied nests were of the latter form and 2 of these had a simpler nest within a meter in the same bush, I suspect that false or 'play' nests are built. As a tree or a nest territory is occupied, the pair may build one or two nests, of which one is chosen for actual nesting, and is added to in later years.

Precise composition of the nests is difficult to determine although grasses (*Digitaria* sp., *Eragrostis* sp., and *Lepturus* sp.) are the most common plant material, with mascerated coconut *Cocos nucifera* frond/bark/fibre and *Cassytha filiformis* also present; coconut husk tendrils were used in the cups of all the nests examined. A nest found within 100 m of human housing contained primarily string and other man-made material such as plastic. All 5 nests are in the collection of the Natural History Museum of Los Angeles County.

I believe the nests are placed in a crotch of a tree for support but also so that the leaves of the cymose inflorescences in the distal forks shade the nest from the sun and rain (Halle *et al.* 1978). During a heavy squall on 21 March, an adult sitting on its nest, containing an egg and young, was effectively shielded from the rain. After I found the first nest I could easily predict in which growth form nests would be found. Height and diameter of the shrub

(up to c. 25 m) seemed important, but large leaf size was also critical. Such mature bushes seem to be limited on the island, but I suspect the population estimate of 300–400 warblers made by Clapp & King (1975) for the mid-1960s remains in 1979.

As 'development' occurs on the island and 'brush' is cleared, the status of the plant species and growth form, and thus of the warbler, may be liable to change rapidly. Since this species apparently is extirpated from Fanning Island, only Washington and Christmas Islands provide the habitat for this poorly known form. Future research plans involve elucidating the breeding biology and will provide management advice on the species to the Gilbertese Government.

Acknowledgements: The TRW Company of Los Angeles provided transport to the island and Mr. Theodore L. Cross supported this research. The Minister of Natural Resource Development of the Gilbertese Government kindly gave permission to study the birds of Christmas Island. Lloyd Kiff preserved the egg and encouraged preparation of this note and Roger Clapp, he and Fred Truxal made valuable comments on the ms. Robert Gustafson and Christopher Davidson gave botanical advice. My appreciation is extended to all.

References:

Child, P. 1956. Birds of the Gilbert and Ellice Islands Colony. Gilbert and Ellice Islands Colony: Education Department. (Mimeo, 36 pp.)

Clapp, R. B. & King, W. B. 1975. Status of the Kokikokiko *Acrocephalus aequinoctialis*. *Bull. Brit. Orn. Cl.* 95: 2–3.

Gallagher, M. D. 1960. Bird notes from Christmas Island, Pacific Ocean. *Ibis* 102: 489–502.

Halle, F., Oldeman, R. A. A. & Tomlinson, P. B. 1978. Tropical Trees and Forests. Springer-Verlag: New York.

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The Roseate Tern *Sterna dougallii arideensis* on Aride Island, Seychelles

by S. R. Warman

Received 21 April 1979

Sterna dougallii arideensis was described by Mathews (1912) from skins collected on Aride Island, Seychelles. Peters (1934) considers it to be 'doubtfully distinct from *S. d. bangsii*', while Penny (1974) states that it is one of 4 recognized subspecies in the Indian Ocean. This uncertain taxonomy makes it difficult to delimit the subspecific range. In the granitic Seychelles *arideensis* has been recorded as breeding on Aride, Mamelles (Vesey-Fitzgerald 1936), Recif (Penny 1974) and Isle aux Vaches off the coast of Mahé (Ridley & Percy 1958). Other colonies are reported from North Island African Banks (Ridley & Percy 1958), on Goelette Island, Farquar Atoll and in the Mascarenes on Rodriguez (Staub 1973) and Cargados Carajos (Newton 1958). Feare (pers. comm.) confirms recent breeding on Isle aux Vaches and North Island African Banks. Nothing has been recorded of the subspecies' breeding biology and the aim of this paper is to record details observed in 1978.

Aride colonies. Procter (1974) estimated that c.2500 pairs of Roseate Terns bred on Aride in 1973 and Todd (1977) obtained a figure of between

4300 and 4800 in 1975. By 1978 the area of the sub-colonies had increased beyond the 1975 limits, but in the absence of comparable density estimates for the 2 years it is possible only to state that an increase in numbers probably occurred.

The Roseate Terns on Aride breed in a number of clearly defined sub-colonies, all between 25 m and 80 m above sea-level, whose positions remained fairly fixed between 1975 and 1978. About half breed in areas of open 'grassland' of differing species composition (dominant herbs are usually one, or a combination, of *Digitaria horizontalis*, *Asystasia gangetica*, *Cyperus ligularis* and *Pennisetum polystachion*). This 'grassland' generally has a persistent layer of plant litter and little exposed soil, nests usually being very shallow trampled depressions in the coarse litter. Much of this habitat is currently being invaded by the introduced pineapple (now gone wild) and Roseate Tern breeding areas may be lost through its spread. The remainder of Aride's Roseate Terns breed in the deep shade of a canopy of *Pisonia grandis*, where there is virtually no herbaceous understorey, but where an intermittent layer of *Pisonia* leaf-litter overlies coarse granite-derived soil. Nests here are generally shallow scrapes in the litter or soil. The birds seem to favour areas of taller woodland with several metres of unimpeded airspace beneath the leafy canopy.

Todd (1977) found a nest density of 0·31 nests per m² for the centre of a large woodland colony and 0·97 per m² for a 'grassland' colony. Vocal squabbles between adjacent nest-holders are frequent and competition for prime (=central?) sites is severe (cf. Feare 1976).

Breeding cycle at Aride. Aride's Roseate Terns breed on a strict annual cycle which is strongly synchronised, and they spend less time on the island than do any of the other breeding seabirds. Lousteau-Lalanne's (1963) statement that 'the Roseate Tern stays near its breeding ground all year round' clearly does not apply to the Aride population: not a single bird was seen on or near Aride outside the period 22 April to 18 August.

22 April. First Roseate Tern seen; none was seen during the next 2 days.

24 April. Many hundreds present at dawn. The simultaneous arrival of such a large number suggests that the terns congregated elsewhere and arrived *en masse* during the night. On the morning of 24 April and on every other morning until the time of laying, the terns took part in a dawn 'fly-past'. These massed flights, which are far more orderly than the 'fairs' of Sooty Terns *Sterna fuscata* (cf. Ashmole 1963), last about 40 minutes, starting just after first light. The birds fly in a closely knit group and call continuously: a large proportion were flying in twos even on their first morning on the breeding ground. A less coherent dusk flight also takes place.

7 May. Until now the birds had made only brief landings on the island. On 7 May the colonies were first occupied—about 2 weeks earlier than the occupation of colonies by Sooty Terns, which by virtue of their size and aggression might otherwise be expected to fare better in competition for nest-sites than Roseate Terns. Courtship was in full swing with fish-offering, display and copulation observed. Nest-sites were being actively defended from neighbours. The bills of all the birds were black, the feet red and the breast feathers markedly pink. In those pairs where the sexes could be separated (by observing copulation) the male appeared to have slightly longer tail

streamers than the female. At this early stage of colony formation the birds were highly vocal and very sensitive to disturbance.

12 May. Colonies at full size: a few eggs laid. Most birds showed a trace of blood-red colouration at the base of the upper mandible.

18 May. At least 60% of pairs had laid and the colonies were less prone to explosive disturbances than before. Over 99% of the nests seen held only one egg, and those with 2 eggs may have been due to layings by 2 females rather than to a clutch of 2. Dawn and dusk 'fly-pasts' were much reduced in length and intensity.

6 June. Incubating : Most of the Roseate Terns had bills which were blood-red for the inner half of their length, though a few still showed no red.

17 June (approx.). First eggs hatched.

26 June. Peripheral pairs still incubating, most of the central pairs having young about one week old.

14 July. A few chicks just flying and colonies beginning to break up as young birds became more mobile and left the vicinity of their nests. Fledged young started to assemble in crèches on the coastline, sometimes several hundred metres from their nest-sites. For the next 3 weeks the crèches grew in size and the young continued to be fed by their parents.

10 August (approx.). Crèches grew smaller as the terns began to leave.

16 August. A few non-flying young still remained, some appearing to have been abandoned by their parents. All the remaining adults had all-red bills.

18 August. Colonies deserted except for a few starving and abandoned young.

20 August. No living Roseate Terns seen.

Breeding mortality

a) *Predation*. For at least a century up until 1975 man was an important predator of Roseate Tern eggs on Aride. Direct predation and the associated loss of eggs through disturbance (see below) must have considerably reduced the breeding success. No data are available on replacement laying though local opinion is that pairs will lay 3 times if eggs are removed. Egg collection has now ceased, so one may expect an increase in the number of young returning to breed.

Two species of lizard, *Mabuya wrightii* and *M. sechellensis* (Scincidae), are known to eat the eggs of Roseate Terns on Aride (Todd 1977); indeed the small size of the eggs renders them more easily broken by these skinks than the larger eggs of Aride's more common ground nesting terns, *Sterna fuscata* and *Anous stolidus*. Todd estimated that in one sub-colony he studied on Aride in 1975 about 7% of the eggs were eaten by skinks. The intensity of egg-predation by *Mabuya* increases with the length of time for which the eggs are left unguarded because of a convergence of lizards towards the centre of any disturbance within tern colonies. Any disturbance which keeps adults off their nests is liable to decrease breeding success.

Cats were introduced by man to Aride in about 1918, but were eliminated within a decade (Ridley & Percy 1958). There are no longer any mammalian predators on Aride.

The Barn Owl *Tyto alba*, another species introduced by man to Seychelles (Lionnet 1971), breeds on Aride (Warman 1978) and kills a number of adult Roseate Terns, though the importance of this mortality is not known.

b) *Parasitism*. Converse *et al.* (1976) isolated a virus from ticks *Amblyomma loculosum* found on sick Roseate Terns on Bird Is, Seychelles. On the assumption that the birds came from Aride, this previously unknown virus was named Aride Virus. Ticks collected from young Roseate Terns on Aride in 1978 have been identified as *Amblyomma loculosum* (Feare, pers. comm.) and are currently being investigated for viral infection at the Unit of Invertebrate Virology, South Parks Road, Oxford. *Amblyomma* itself may cause mortality in young Roseate Terns; it attaches itself to the legs and feet of hatchlings and being a very large tick can cause severe malformation of the limbs, crippling the birds. Adults have been seen with foot damage similar to that seen in crippled chicks but with no ticks attached, so it appears that infestation with *Amblyomma* (and Aride Virus?) does not necessarily prevent Roseate Terns reaching maturity. Nothing is known of the epidemiology of the virus, though it may be responsible for at least part of a 24% mortality of unfledged young reported by Todd (1977). The dead young showed no outward sign of disease, so serological confirmation of infection is needed.

c) *Other Mortality*. Todd (1977) reported a 12% failure of eggs through unknown causes. Food shortages and attack by Frigatebirds, *Fregata minor* and *Fregata ariel*, as well as by undocumented parasites, must cause additional mortality in young and adults.

Conservation. It is clearly important that more is known about the taxonomic status, breeding distribution, and behaviour of *S. d. arideensis* if effective conservation measures are to be carried out throughout its range. Away from the breeding grounds even less is known about *arideensis* and the pressures it faces; large scale ringing operations (perhaps of fledglings in their crèches to avoid disturbance in the colony) are necessary to determine the non-breeding distribution of Seychelles birds. On Aride, at least, it seems that the population is holding its own or possibly increasing. Aride is now a nature reserve administered by the Society for the Promotion of Nature Conservation (SPNC) and protected by Seychelles Law, so that as long as the enlightened policy of SPNC towards this vulnerable species is enforced by local wardening there is no immediate threat to the Aride population. Points of particular conservation importance are: (i) that incoming cargoes are carefully screened for predators, especially rats; (ii) that the Roseate Tern colonies are not subjected to disturbance—low-flying aircraft are becoming an increasing problem on Aride, causing massive disturbance to all its breeding seabirds; and (iii) the establishment of reserves (or restricted access during the breeding season) at the species' other breeding islands.

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References:

Ashmole, N. P. 1963. The biology of the Wideawake or Sooty Tern *Sterna fuscata* on Ascension Island. *Ibis* 103b: 297–364.

Converse, J. D., Hoogstraal, H., Moussa, M. I., Kaiser, M. N., Casals, J. & Feare, C. J. 1976. Aride Virus, a new ungrouped arbovirus infecting *Amblyomma loculosum* ticks from Roseate Terns in the Seychelles. *Arch. Vir.* 50: 237–240.

Feare, C. J. 1976. The breeding of the Sooty Tern *Sterna fuscata* in the Seychelles and the effects of experimental removal of its eggs. *J. Zool.* 179: 317–360.
Lousteau-Lalanne, P. 1963. Sea and shore birds of the Seychelles. *Occ. Publs. Seych. Soc.* 2: 1–20.
Lionnet, J. F. G. 1971. 'Seychelles' in *Tech.Commun. Commonw. Inst. Biol. Control* 5: 87–91.
Mathews, G. M. 1912. *Birds of Australia.* London.
Newton, R. 1958. *Ornithological Notes on Mauritius and the Cargados Carajos Archipelago.* Port Louis: Mauritius.
Penny, M. 1974. *The Birds of Seychelles and the Outlying Islands.* Collins: London.
Peters, J. L. 1934. *Checklist of Birds of the World.* 2: 355. Harvard Univ. Press: Camb. Mass.
Procter, J. 1974. *A Management Plan for Aride Island, Seychelles.* Cyclostyled draft to SPNC, incorporated in Warman (1978).
Ridley, M. W. & Percy, R. 1958. Exploitation of Seabirds in Seychelles. *Col. Res. Stud.* 25: 1–78.
Staub, F. 1973. Birds of Rodriguez Island. *Proc. Roy. Soc. Arts and Sci. Mauritius* 4, part 1: 17–59.
Todd, D. M. 1977. *in* Warman (1977).
Vesey-Fitzgerald, L. D. E. F. 1936. *Birds of the Seychelles and Other Islands Included within that Colony.* Govt. Printer, Victoria: Seychelles.
Warman, S. R. (Ed.) 1976. Oxford University Expeditions to Aride Island, Seychelles. *Bull. Oxf. Univ. Explor. Club*, n.s. 2.
Warman, S. R. 1977. Aride Island Nature Reserve, Seychelles. First Report to SPNC (cyclostyled).
— 1978. Aride Island Nature Reserve, Seychelles. Report to SPNC. 4 parts, cyclostyled.

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Relationships and speciation in the Australian corellas (Psittacidae)

by Richard Schodde, G. T. Smith, I. J. Mason & R. G. Weatherly

Received 8 May 1979

Corellas are white cockatoos (*Cacatua* spp.) with short, undifferentiated crests, rather fine bone-coloured bills, and milky to leaden periophthalmic skin that in Australian members extends as a bare oval area below the eye down the side of the face. There are 3 principal forms in Australia: one short-billed and round-winged in the inland and north, another long-billed and pointed-winged in the southeast, and the third long-billed and round-winged in the southwest (Fig. 1). From Mathews (1912) to Forshaw (1969, 1973) and Condon (1975), the short-billed form has been separated as a distinct species, *C. sanguinea*, while the 2 populations of long-bills have been treated as subspecies of each other, *C. tenuirostris tenuirostris* in the east and *C. t. pastinator* in the west. This reflects the view that the long-billed corellas are of common origin and diverged after long-billed and short-billed corellas split. Earlier revisers (e.g. Salvadori 1891) even put short-billed and long-billed forms in separate genera.

Our studies of living populations of all 3 forms and of collections in Australian museums (301 adults) indicate, on the contrary, that the long bill has evolved convergently in southeastern and southwestern Australian populations simply as an adaptation to feeding by digging. That this has happened is revealed in other characters, notably shape of wing, proportions of the body, size of crest, thickness of the bill, structure and colouring of the

feathers on the foreneck and face, tone of the underwing and calls. These characters have either been overlooked or misinterpreted in the literature and, besides, *none* of the recent descriptions is accurate.

The long-billed corella of eastern Australia (*tenuirostris*) is by far the most distinctive of the three. It is a stocky bird with a disproportionally short tail (mean tail: wing ratio 0·45), a vestigial crest (usual length 33–34 mm), and a pointed wing in which the second outermost primary is longest and the sixth disproportionally shorter than the fifth (Fig. 2). By contrast, short-billed (*sanguinea*) and western long-billed (*pastinator*) corellas are similar to

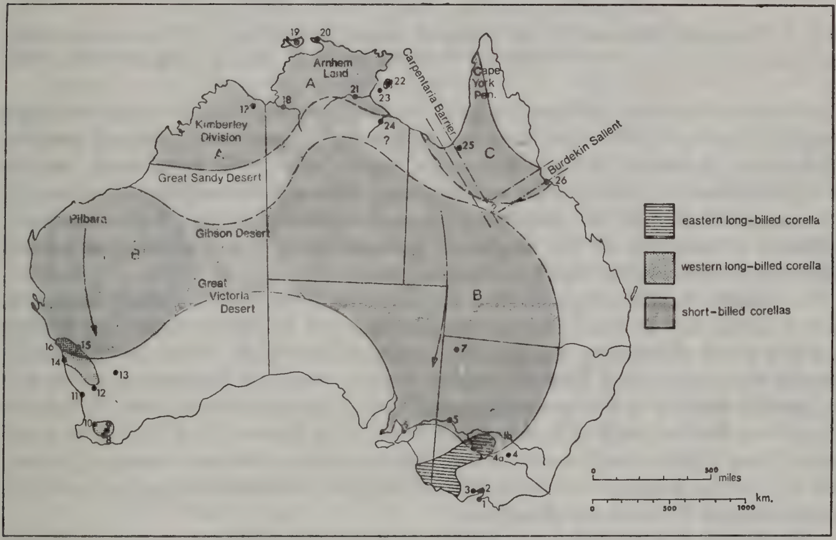

Fig. 1. Distribution of Australian corellas. Letters indicate subspecies of short-billed corellas, viz. A.=*C. p. sanguinea*, B.=*C. p. gymnopis*, C.=*C. p. normantoni*. Arrows indicate probable, independent sources of the two long-billed corellas. Numbers indicate localities in text, viz. 1—Mornington Peninsula; 2—Port Phillip Bay; 3—You Yangs; 4—Riverina; 4a—Murray River; 4b—Murrumbidgee River; 5—Mildura; 6—Adelaide; 7—Milparinka; 8—Lake Muir; 9—Frankland; 10—Boyup Brook; 11—Perth (Swan River); 12—Northam; 13—Mukinbudin; 14—Jurien; 15—Morawa; 16—Geraldton; 17—Kununurra; 18—Victoria River; 19—Melville Island; 20—Cobourg Peninsula (Port Essington); 21—Roper River; 22—Groote Eylandt; 23—Maria Island; 24—McArthur River; 25—Normanton; 26—Townsville.

each other and different from eastern long-bills in their slender shape and in having longer tails (mean tail: wing ratio 0·49 in both), longer crests (usual length 41–57 mm in short-bills and 47–58 mm in western long-bills), and more rounded wings in which the third outermost primary is the longest and the distance between fifth, sixth and seventh primaries subequal.

The maxilla of the eastern long-bill (Fig. 3a) itself differs from that of the western (Fig. 3b) in its slenderness and stronger bilateral compression (mean width: length ratio of maxilla 0·33 in eastern form, 0·38 in western form). (Here length of the maxilla is the chord of the culmen measured from the cere and width of the maxilla is its greatest breadth at the feather-line.) The western long-bill has the heavier bill similar to that of the short-bill (Fig. 3c)

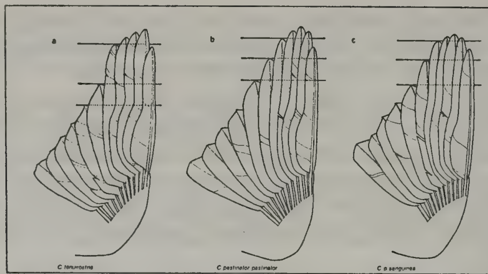

Fig. 2. Structural differences in the wings of Australian corellas. a. *C. tenuirostris*=eastern long-bill, b. *C. pastinator pastinator*=western long-bill, c. *C. p. sanguinea*=short-bill.

and also the broader culmen; indeed, it is a 'short-bill' in which the tip of the maxilla has merely become prolonged. Forshaw (1969: 101) claimed that the differences between 'long' bills and 'short' bills were structural, but he compared eastern rather than western long-bills with short-bills. Concerning curvature of the bill, we stress that the angle of inclination of the lower mandible is a function of the angle of declination of the maxilla and related directly to the use to which the bill is put.

In colour, eastern long-bills are much the most brightly marked (standards from Kornerup & Wanscher 1978). They have a splash of scarlet feathering on the lores extending broadly down the sides of the face and narrowly across the forehead, a distinct reddish yellow wash on feathers fringing the posterior margin of the periophthalmic skin, and an exposed band of scarlet down on the foreneck. On the other hand, they have only the faintest trace of sulphur yellow on the underwing. The feathers of the fluffy band of colour on the foreneck are structurally distinctive in that the feather proper is of the same downy form as its aftershaft.

Short-bills and western long-bills have facial colour more-or-less restricted

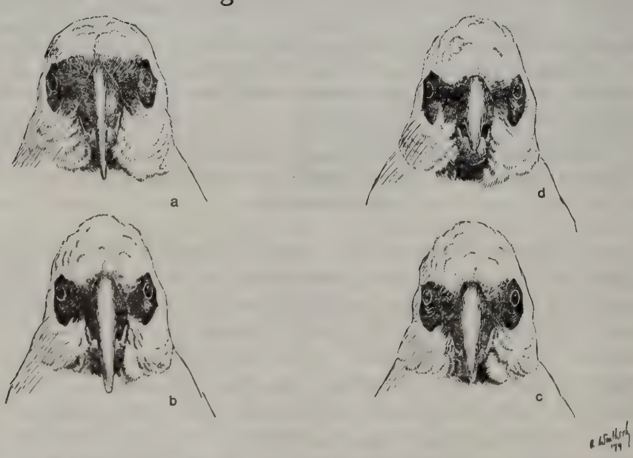

Fig. 3. Bills of Australian corellas, A.=*C. tenuirostris* (eastern long-bill), B.=*C. pastinator pastinator* (western long-bill, extreme southwest), C.=*C. p. pastinator* (Western Australian wheat-belt), D.=*C. p. gymnopis* (short-bill).

to the lores and more orange-red in tone. Both also lack the wash behind the orbital skin, and show little or no light orange to orange-red on the foreneck because the feathers proper there are usually normal in structure and white and hide the orange tone of the down. Yellow on the underwing, though much stronger, is individually variable in intensity in southeastern short-bills, and it increases in depth and consistency of tone northwards to Arnhem Land and the Kimberley Division and westwards to the Pilbara, becoming strongest of all in southwestern long-bills.

Concerning calls, the yodelling contact notes of the eastern long-bill are more staccato and higher pitched than those of the short-bill and western long-bill. Other vocalizations of all 3 forms, although seeming to be alike, have not yet been properly identified and compared.

Eastern long-bills seem to have closer affinity with short-bills in inland eastern Australia than with western long-bills, judged by the extent of yellow on the underwing and tone of red on the face. There is as yet, however, no evidence of hybridization between them where they now meet in the open eucalypt forests of *Eucalyptus camaldulensis* along the Murray and Murrumbidgee river systems (Fig. 1). During the period that records have been kept (e.g. Hobbs 1961) the 2 forms have had virtually discrete ranges, until recent years. The eastern long-bill originally occurred in rather small, localized populations in the southeast of South Australia, in western and northern Victoria east of the mallee, and in the Riverina of New South Wales. Short-billed birds, on the other hand, were confined to the eucalypt-lined water-courses of inland Australia and extended little further southeast than Mildura on the Murray River. Since then, both forms have expanded their ranges (Fig. 1) and appear to have increased in numbers dramatically in southeastern Australia, the reasons for which are being investigated by Smith. Both have been found mixing in flocks in central and northern Victoria (W. Emison and H. E. A. Jarman) and in the southern Riverina during 1977–1978. The effects of this mixing are being kept under observation.

Long-billed corellas in southwestern Australia differ from adjacent populations of short-bills to the north only in their larger size (Bergmann's Rule) and disproportionally larger bills. In all other morphological characters they are indistinguishable and their rolling contact-calls are alike. That western long-bills and short-bills are very closely related was first pointed out by Mees (1961: 102–103), who drew attention to specimens from the northern part of the range of the western long-bill with bills intermediate between the two (cf. also Fig. 3). As a result, he combined not only short-billed and western long-billed forms but also eastern long-billed forms under one species, *C. tenuirostris*. On the other hand, Saunders' (1977) study of the growth of bills in young western long-bills implies that Mees' intermediates could have been immatures, and in fact our observations suggest that growth of the bill may be slower in fledgling western than fledgling eastern long-bills.

There is now extensive overlap between short-billed and western long-billed corellas in the northern wheat-belt of Western Australia where the short-bill is extending its range southwards through sub-coastal Western Australia (Fig. 3 and see Serventy & Whittell 1976: 273–4). Our records indicate that breeding populations of short-bills began to enter the northern breeding range of long-bills from the 1950's onwards.

The western long-bills are presently restricted to 2 isolated populations that differ in measurements (Table 1, Fig. 4). One, of larger birds, occurs in fields almost cleared of Jarrah *Eucalyptus marginata*—Marri *E. calophylla* forest in the region between Boyup Brook, Lake Muir and Frankland in extreme southwestern Western Australia. The other, of smaller birds, is found in Wandoo *E. wandoo*—Salmon Gum *E. salmonophloia* woodland, or its remnants, in the wheat-belt northeast of Perth between Geraldton, Morawa, Mukinbudin, Northam and Jurien (Fig. 1). These 2 populations may have been joined formerly around either side of the Jarrah belt (see Serventy & Whittell 1976: Fig. 4) as recently as the mid 1800s (cf. Carter 1912).

TABLE 1

Comparison of length of wing and culmen (mm) between populations of *Cacatua pastinator* in south- and mid-western Australia. The values for length of wing and culmen (from cere) are means ± the standard deviation. Superscripts to values of *t* indicate significance of difference, viz.: NS=not significant, $* = 0·05 < p < 0·02$, $** = 0·01 < p < 0·001$, $*** = p < 0·001$.

Group	Latitude (°S)	No.	Wing	*t*	Bill	*t*
MALES						
Southern Long-bills	35–33	11	315·9 ± 9·5		48·8 ± 1·6	
				3·42**		7·08***
Northern Long-bills	30–28	15	302·7 ± 9·9		42·7 ± 2·5	
				9·20***		16·33***
Short-bills from area of overlap with long-bills	31–29	16	276·7 ± 5·3		31·5 ± 1·1	
				3·78***		0·93 NS
Short-bills from Pilbara	25–20	11	266·6 ± 8·6		31·1 ± 1·1	
FEMALES						
Southern Long-bills	35–33	11	306·5 ± 5·2		45·2 ± 2·3	
				5·14***		6·22***
Northern Long-bills	30–28	24	291·9 ± 8·7		40·3 ± 2·1	
				10·05***		19·55***
Short-bills from area of overlap with long-bills	31–29	19	269·7 ± 4·6		30·2 ± 0·9	
				2·26*		0·18 NS
Short-bills from Pilbara	25–20	9	262·4 ± 12·6		30·3 ± 2·0	

Populations of short-bills overlapping the northern long-bills in Western Australia differ from them in size in just the same way as the 2 long-bills do from each other, but to a greater degree (Fig. 3, Table 1). A plot of length of wing and bill on latitude for short-bills and long-bills from the Pilbara district south (Fig. 4), taken from adults and immatures with adult proportions, suggests that all populations there once clined continuously from small size in the north to large in the south. Regression equations were not calculated because of limitations in the geographical spread of the data. Measurements of short-bills south of the Pilbara (boxed on graph) are consistent with other evidence (see above) that the southern short-bills came from the north, probably from the Pilbara. Their wings are, however, rather larger than those from the Pilbara but whether this is the result of the effect of latitude or of introgression with long-bills is not yet known. Significantly, bills do not differ (Table 1), probably because they respond to other factors such as hardness of ground and accessible sources of food.

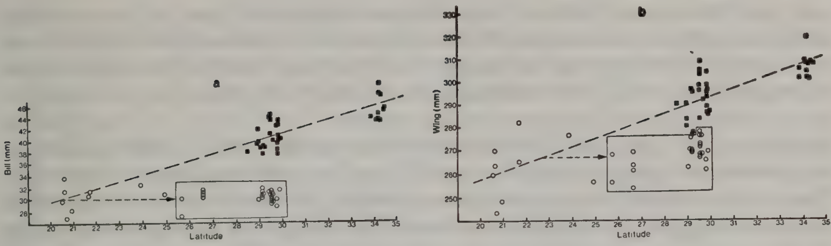

Fig. 4. Graph of length of bill (a) and wing (b) of female long- and short-billed corellas on different latitudes in the Pilbara and southwest of Western Australia. Solid squares represent the two populations of western long-bills and open circles all short-bills. Females were chosen because their samples were larger (see Table 1).

The present pattern of distribution of long-bills and short-bills in Western Australia probably arose from a break-up of continuously grading populations during one of the last Plio-Pleistocene cycles of aridity. At that time, relict populations of short-bills in the north on the major timbered rivers of the Pilbara district (21°–25°S) probably became widely separated from long-bills further south (30°–35°S). The situation today suggests that the long-bills are holding largely to their ancestral territory while the short-bills are colonizing ground lost to intermediate populations.

Interaction between short-bills and western long-bills is difficult to assess at present because they have met so recently. Wherever we have observed them together they have tended to segregate in separate groups and sub-groups. How far this is maintained by an established communal system or by separate responses to subtle differences in contact calls is not yet known. Under these circumstances, there is no way of assessing even the potential of hybrids to compete and survive with bills neither as well fitted for digging nor for breaking fruit as those of parental types. Corellas appear to mate for life and are long-lived. Thus we are cautious about attaching much significance at this stage to sympatry in Western Australia, if only because cross-pairing has so far had little time and opportunity to manifest itself. The situation is being kept under observation and will be examined in more detail in a future paper.

The weight of present evidence, taking all morphological, behavioural and temporal factors into account, favours combining the short-bills and western long-bills in one species, *C. pastinator* and separating the eastern long-bill, *C. tenuirostris*, as distinct. This corroborates the earlier opinion of Lendon (1968, 1973). We adopt this view with the proviso that short-bills and western long-bills may themselves prove to behave as 'good' species towards each other (see, e.g, Short (1969) for criteria).

These forms and the subspecies that we recognize in Australian short-bills are detailed below. Certain patterns of variation among the short-bills, however, merit preliminary comment. There are 3 geographical entities, treated here as subspecies, that differ from each other in size and in the depth and extent of orange-red on the lores and in the down of the feathers on the head and neck. One, *C. p. sanguinea*, in Arnhem Land and the Kimberley Division (a in Fig. 1) is large and has little trace of pale orange-red on the

lores and less or none in the down. The second (b in Fig. 1), *C. p. gymnopis*, in central western and central northern Australia southeast to Adelaide and the Murray River system, is smaller and the most extensively coloured on lores and down of any short-bill; neither Forshaw (1969, 1973) nor Condon (1975) distinguished this form from *sanguinea*. The third (c in Fig. 1), *C. p. normantoni*, on Cape York Peninsula, is the smallest and is intermediate in the amount of orange on the lores and down between *sanguinea* and *gymnopis*. There is little clinal intergradation and, indeed, character gradients are steep at zones of apparent secondary contact. The colour of periophthalmic skin also varies between these forms; that of *sanguinea* is pallid or whitish-grey (cf. *C. goffini*, *C. ducorpsii*), that of *gymnopis* leaden grey as in eastern and western long-bills, and that of *normantoni* is unrecorded.

The large size of birds from Arnhem Land and the Kimberley Division, stressed by Saunders (1978), is contrary to Bergmann's Rule. Birds from the southwestern Kimberley are smaller (mean wing 288 mm for 10♂♂: cf. mean wing 298 mm for 20♂♂ from the northeast Kimberley (Kununurra)) and, like those on Groote Eylandt, have more orange tone to the lores and facial down than is usual. This probably reflects intergradation with *gymnopis* in Western Australia before the two were separated by the Great Sandy Desert (Fig. 1). Subspecies of the Spinifex Pigeon *Geophaps p. plumifera* from the Kimberleys and *G. p. ferruginea* of the Pilbara also merge there in similar circumstances (Crome *et al.* in press). Lacking specimens, we have little information yet on intergradation eastwards, from the Victoria to the Roper and McArthur Rivers in the Northern Territory.

C. p. gymnopis varies insignificantly in size throughout its vast range in eastern Australia from the Murray River to the mid Northern Territory across 18 degrees of latitude, and does not approach *C. p. normantoni* clinally. In the west, in the Pilbara of Western Australia it is the same size as in the east, but, as mentioned above, becomes somewhat larger southwards. Colour on the lores and down parallels this pattern, being most extensively rich orange-red in southwestern populations and becoming clinally slightly paler and more pinkish (aff. *C. tenuirostris*) eastwards.

C. p. normantoni is markedly smaller than adjacent populations of *gymnopis* to the south (cf. Bergmann's Rule) and similar in size to short-billed corellas in southern New Guinea (Mees, in prep.). It seems likely that it has been separated historically from the other Australian populations by two ornithological barriers: the treeless Carpentaria Barrier (Macdonald 1969) stretching south from the eastern head of the Gulf of Carpentaria into central Queensland, and the dry east-west Burdekin salient (Keast 1961) that reaches Townsville and is now colonized by corellas.

Regional variation in the extent of yellow on the underwing has been discussed above and crosses the discontinuities in size and facial colour.

Taxa

1. *Cacatua pastinator pastinator* (Gould), 1841, Proc. Zool. Soc. Lond. 1840: 175 (Western Australia probably=Swan River, judging from Gilbert's itinerary and measurements of the type).

Characters: Size very large (wing ♂♂ 297–327, ♀♀ 283–319 mm); bill long (culmen from cere ♂♂ 39·8–52·0, ♀♀ 37·4–49·7 mm); tail long (tail/wing

ratio 0·49–0·51 usually); wing very broadly rounded and intensely sulphur yellow underneath; crest long (47–56 mm usually); lores and facial down mid orange-red, feathering on foreneck mainly normal.

Range: Southwestern Australia where there are two isolated populations—see Fig. 1.

Notes: 26 adult males and 35 adult females were studied. Although the 2 discrete populations differ in size (Table 1), they are combined under one subspecies because both are long-billed and were probably linked by primary clines until at least the middle of the last century. The type of *pastinator*, a male (Stone 1913) with a wing of 305/307 mm and culmen of 42/43·3 mm (Gould 1841, Frank B. Gill), is closest to the northern population in size.

2. *C. p. sanguinea* Gould, Feb. 1843, Proc. Zool. Soc. Lond. 1842: 138 (North coast of Australia=Port Essington, Cobourg Peninsula).

Characters: Size moderately large (wing ♂♂ 264–310, ♀♀ 257–302 mm); bill short (culmen from cere ♂♂ 31·1–36·5, ♀♀ 28·3–36·6 mm); tail long (tail/wing ratio 0·50–0·52 usually); wing broadly rounded and strongly sulphur yellow underneath; crest long (47–57 mm usually); lores and facial downwith faint trace of pale orange-red or colour lacking, feathering on foreneck normal.

Range: Kimberley Division and Arnhem Land—see a in Fig. 1.

Notes: 40 adult males and 40 adult females were studied, including individuals from islands off-shore from Arnhem Land (Melville, Groote and Maria) which are all a little smaller than populations on the adjacent mainland. Synonyms are *distincta* Mathews, *subdistincta* Mathews, *apsleyi* Mathews and *derbyi* Mathews (new synonym, cf. Condon 1975); *rhodolorus* Finsch was not proposed seriously and should be deleted as a new name for *sanguinea* Gould.

3. *C. p. gymnopis* Sclater, 1871, Proc. Zool. Soc. Lond. 1871: 493 (interior of South Australia).

Characters: Size moderately small (wing ♂♂ 255–290, ♀♀ 244–283 mm); bill short (culmen from cere ♂♂ 26·5–32·8 (-37·8), ♀♀ 27·0–33·3 mm); tail long (tail/wing ratio 0·47–0·50 usually); wing broadly rounded and usually strongly sulphur yellow underneath; crest long (43–50 mm usually); lores and facial down pale to mid orange-red, feathering on foreneck normal.

Range: Central western and inland eastern Australia but sparse and irregular in Gibson and Great Victoria Deserts—see b in Fig. 1.

Notes: 53 adult males and 58 adult females were studied. All individuals with wings and bills longer than 280 mm and 33 mm respectively were from western Australia and may reflect past or present gene flow from nominate *pastinator*. Macdonald (1974), when claiming inland 'South Australia' as the type locality of *gymnopis* and not Port Essington as Mathews (1917) had said, gave no characters by which *gymnopis* could be identified geographically. Sclater's description, with its reference to feather bases on neck and belly as well as head tinged reddish, indicates the inland form and corroborates the type locality that Sclater finally fixed on, namely 'interior of South Australia'. Although selecting no type, Sclater clearly based *gymnopis* on a live bird in the London Zoo, and its illustration (Fig. 4 in Sclater) therefore typifies it (*pace* Macdonald 1974); Sturt's specimens from Milparinka are paratypes. Synonyms are *ashbyi* Mathews and *westralensis* Mathews; note that

the type locality of *ashbyi* is Yanco Glen, north of Broken Hill, New South Wales (*pace* Condon 1975).

4. *C. p. normantoni* Mathews, 1917, Bds. Australia 6: 211 (Normanton, Queensland).

Characters: Size very small (wing ♂ 248, ♀♀ 238–246 mm); bill short (culmen from cere ♂ 30·1, ♀♀ 28·1–29·6 mm); tail long (tail/wing ratio 0·47); wing rounded and strongly sulphur yellow underneath; crest rather long (41–42 mm); lores and facial down pale orange-red, feathering on foreneck normal.

Range: Western Cape York Peninsula—see c in Fig. 1.

Notes: One male and 3 females were examined from AMNH from the original series taken by Robin Kemp at Normanton. There were no specimens available in Australian museums, and the distribution of this form can only be estimated from sight records at present.

5. *C. tenuirostris* Kuhl, 1820, Nova Acta Acad. Caesar. Leop. Carol. 10: 88 ('Nova Hollandia'=Port Phillip Bay).

Characters: Size medium (wing ♂♂ 268–288, ♀♀ 255–278 mm); bill long and slender (culmen from cere ♂♂ 46·3–52·6, ♀♀ 41·6–50·6); tail short (tail/wing ratio 0·44–0·46 usually); wing pointed and faintly sulphur yellow underneath; crest short (33–34 mm usually); lores and facial down scarlet, the feathers proper on the foreneck reduced, downy and scarlet, like their aftershafts, and forming an exposed band of colour.

Range: Southeastern Australia—see Fig. 1.

Notes: 23 adult males and 24 adult females were studied. Dickison's (1928) restriction of the type-locality of *pastinator* to the You Yangs, Victoria, is not documented convincingly. His remarks merely show that Kuhl's bird must have come from either Mornington Peninsula or the coast of Port Phillip Bay opposite (cf. also Mathews 1917: 215). The only synonym is *nasicus* Temminck.

From the aspect of evolution it seems likely that eastern and western long-bills arose independently from short-billed corellas. Short-bills today have a bill of conventional cacatuine shape, a rounded wing, a moderately long crest, an extensive yellow wash under wing and tail, and normal feathering on the throat, all of which we judge to be ancestral (plesiomorphous) characters because they occur in other species of *Cacatua*. All of the distinctive features of *C. tenuirostris*, on the other hand, appear to be derived. Ancestral corellas were probably seed-eating birds that, like other Australian Cacatuini, won their food by picking it up off the ground. Finding fruit, they cracked and tore it open with the bill, just as short-bills do today. Past and present climates in southern Australia, cooler and with lower evaporation, would have left the ground there softer for longer periods than in the north. Under these circumstances, selection evidently favoured local evolution of long bills that could dig for corms and bulbs as well. Today both the long-bills are specialized feeders, foraging selectively on the subterranean corms and bulbs of native Lilialean herbs, and the introduced *Romulea rosea* (Lendon 1968, Saunders 1977) when not taking spills and sowings of wheat and other grains in agricultural districts.

The divergence of the long-bills and different subspecies of short-bills probably followed the break-up of a widespıead ancestral population and the isolation of its members in refugia throughout Australia during the climatic fluctuations of the Plio-Pleistocene. First, proto-*tenuirostris* was split off in the southeast. Later, proto-*pastinator* in the southwest, proto-*sanguinea* in the northwest, proto-*gymnopis* in central Australia, and proto-*normantoni* in the northeast were separated, perhaps simultaneously or almost so. At the present time it is more important to clarify the nature and sequence of events than to speculate on their timing, but both the latter will be examined in more detail in a later paper.

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References:

Carter, T. 1912. Notes on *Licmetis pastinator* (Western Long-billed Cockatoo). *Ibis* Ser. 9(6): 627–634.
Condon, H. T. 1975. *Checklist of the Birds of Australia. 1. Non-Passerines.* Royal Australasian Ornithologists Union: Melbourne.
Crome, F. H. J., Carpenter, S. M. & Frith, H. J. In press. Geographic variation and taxonomy of the Spinifex Pigeons (*Geophaps plumifera*). *Aust. J. Zool.*
Dickison, D. 1928. Type locality of the Corella. *Emu* 28: 82.
Forshaw, J. M. 1969. *Australian Parrots.* Lansdowne Press: Melbourne.
— 1973. *Parrots of the World.* Lansdowne Press: Melbourne.
Gould, J. 1841. *Licmetis pastinator. Proc. Zool. Soc. Lond.* 1840: 175.
Hobbs, J. N. 1961. The birds of south-west New South Wales. *Emu* 61: 21–55.
Keast, A. 1961. Bird speciation on the Australian Continent. *Bull. Mus. Comp. Zool. Harvard* 123: 305–495.
Kornerup, A. & Wanscher, J. H. 1978. *Methuen Handbook of Colour.* 3rd Edn. (Revised by D. Pavey) Eyre Methuen: Perth.
Lendon, A. H. 1968. The distribution of the Australian Psittacines (Order Psittaciformes—Parrots, Cockatoos, etc.). *South Aust. Orn.* 25: 3–17.
— 1973. *Australian Parrots in Field and Aviary.* Angus and Robertson: Sydney.
Macdonald, J. D. 1969. Notes on the taxonomy of *Neositta. Emu* 69: 169–174.
— 1974. Name of southern subspecies of Little Corella. *Emu* 74: 195.
Mathews, G. M. 1912. A reference-list to the birds of Australia. *Novit. Zool.* 18: 171–446.
— 1917. *The Birds of Australia*, vol. 6. Witherby & Co: London.
Mees, G. F. 1961. An annotated catalogue of a collection of bird-skins from West Pilbara, Western Australia. *J. Roy. Soc. W. Aust.* 44: 97–143.
Salvadori, T. 1891. Psittaci, or Parrots. *Catalogue of the Birds in the British Museum*, vol. 20. British Museum (Natural History): London.
Saunders, D. A. 1977. Breeding of the Long-billed Corella at Coomallo Creek, W. A. *Emu* 77: 223–227.
— 1978. Measurements of the Little Corella from Kununurra, W. A. *Emu* 78: 37–39.
Sclater, P. L. 1871. On animals in the menagerie. *Proc. Zool. Soc. Lond.* 1871: 490–493.
Serventy, D. L. & Whittell, H. M. 1976. *Birds of Western Australia*, 5th ed. University of Western Australia Press: Perth.
Short, L. L. 1969. Taxonomic aspects of avian hybridization. *Auk* 86: 84–105.
Stone, W. 1913. A list of the species of Australian birds described by John Gould, with the location of the type-specimens. *Austral. Av. Rec.* 1: 129–183.

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The nest and eggs of the Bar-winged Weaver *Ploceus angolensis*

by R. Stjernstedt & D. R. Aspinwall

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Irwin & Benson (1966) describe a fallen nest, similar to those described below, which had been collected by C. J. Vernon in north western Zambia and was attributed to the Bar-winged Weaver *Ploceus angolensis*. There appears to be nothing else on record regarding the breeding of this miombo endemic species, which ranges, rather sparsely, westwards from Zambia to southern Zaire and Angola.

Between December 1977 and October 1978 10 nests and one clutch of eggs were found by our assistants, principally G. and J. Sikombe, and ourselves in an isolated block of miombo woodland at Chinkuli (15° 18′ S, 28° 34′ E), 35 m northeast of Lusaka and at the southeastern extremity of the bird's known range. This block measures c. 2.5 km^2, is divided by a dambo (open grassland along a drainage line) and is surrounded by land largely cleared for settlement and agriculture. A notable feature of the block is an abundance of *Usnea* ('Old-man's-beard') lichen, which is by no means ubiquitous in miombo woodland and is more characteristic of areas moister than Chinkuli. The block has a rich avifauna, including all the locally occurring miombo endemic bird species, of which most probably breed there and typically synchronise their breeding with the flush of insect life in about November. Many of these birds spend much of their time in mixed bird parties, and it is in these that the Bar-winged Weaver, a resident that has been noted in all months of the year, is usually to be seen. During a general survey of the block's avifauna, the bird was located on 19 of 36 visits and was usually seen to be feeding, creeping along trunks and thick branches covered in crinkly lichen, often in the company of Miombo Tits *Parus griseiventris,* which feed in a similar manner. Sometimes the Red-headed Weaver *Malimbus rubriceps,* which is also insectivorous, was present in the same bird party, but it feeds by searching at branch tips and leaf clusters. Frequently the whereabouts of the Bar-winged Weaver was first detected when it uttered either its distinctive squeaky contact call 'tyee-titi' or, on occasions, its song (Aspinwall 1973), reminiscent of that of another solitary insectivorous weaver, the Dark-backed Weaver *P. bicolor*.

Of the 10 nests, 8 were found in a small part of the woodland block, roughly 200 m x 200 m, with distances between neighbouring nests of between 30 and 100 m: the other 2 nests were across the dambo. Nests were c. 10 m above ground level, situated rather inconspicuously in the canopy of the woodland's 2 dominant tree species only (Table 1). In the lower branches of a tree interlocked with that containing Nest 2 were two Red-headed Weaver nests. The roofs of the nests were woven into up to 5 branchlets not more than 5 mm thick, from which the nests thus hung. The nests were roughly spherical, with a funnel, sometimes long, hanging down from one side: 5 nests were measured (Table 1). Eggs were found in Nest 7, which had a 'false entrance' in the side of the funnel just below the sphere of the nesting chamber, and to our assistants, who actually felt the nest while it was in use, it appeared that this 'false entrance' constituted a second chamber.

TABLE 1

Bar-winged Weaver *Ploceus angolensis* nests: sites and measurements (cm)

Nest number	Date found	Tree species	Maximum external diameter Nesting chamber	Funnel	Length of funnel below bottom of nesting chamber
1	3 Dec.	B.b.	14	5	3
2	3 Dec.	J.g.	12	6	9
3	10 Dec.	J.g.	14	6	12
4	8 Jan.	J.g.	—	—	—
5	29 Jan.	B.b.	—	—	—
6	29 Jan.	B.b.	Too disintegrated to measure.		
7	21 May	B.b.	12	8	16
8	17 Sept.	B.b.	14	6.5	21
9	24 Sept.	B.b.	—	—	—
10	24 Oct.	B.b.	—	—	—

Note: B.b. = *Brachystegia boehmii*. J.g. = *Julbernardia globiflora*.

All nests were made of *Usnea* worked into a supporting framework consisting of pieces, no more than 2 mm wide, of fine dry grass stems plus a few leaf midribs. A similar nest (unattended, though Bar-winged Weavers were seen in a bird party nearby) was found by Dr E. H. Penry and D.R.A. about 250 km northeast of Chinkuli at Mulilima (13° 22′ S, 29° 57′ E) on 24 March 1978. The requirement for *Usnea* in nest construction is doubtless a factor which limits the distribution and abundance of the Bar-winged Weaver. Nests that were not collected, fell or disintegrated within a year at the most. Collected nests are in the care of the Livingstone Museum, Major J. F. R. Colebrook-Robjent, Prof. N. E. Collias and Dr. J. H. Crook. Since it seems unlikely that all 8 nests found in the same part of the woodland were used for breeding, it is possible that some were 'cock nests', never consummated by breeding. It seems likely that one or more of Nests 1-6 had been used for breeding in about October 1977, though no apparently immature birds were specifically noted in subsequent months. Bar-winged Weavers were actually seen at only 3 nests: on 3 December one was clinging to the funnel of Nest 1, on 8 January one was constructing the framework of the funnel of Nest 4, and at Nest 7 the following observations were made:

21 May: One bird (male?) arrived with a fine grass stem, wove it into the nest, which was in an early stage of construction, comprising grass alone, and departed, returning after about 2 minutes with another grass stem. In the meantime the second bird (female?) entered the chamber, weaving and shaping the nest, moving away and sitting on a nearby branch when the first bird returned. This sequence was repeated 3-4 times without a break.

4 June: No development.

18 June: No bird was seen but *Usnea* had been incorporated into the nest.

16 July: No development. Bar-winged Weavers were seen in a bird party about 200 m away.

12 Sept.: The pair copulated twice about 1 m from the nest. Each bird clung briefly to the outside of the spout without entering.

24 Sept.: A bird flew out of the nest when G. Sikombe climbed up to it, but the nest was empty.

1 Oct.: No bird was seen but the nest contained 2 eggs, which G. Sikombe collected.

24 Oct.: The nest was found on the ground and collected.

We are indebted to Major J. F. R. Colebrook-Robjent for the following information about the eggs, which are now in his collection. They measure 21.4 x 15.6 and 19.7 x 15.0 mm and their combined mass was 4.8 g. The larger egg contained a minute embryo, but the smaller egg had no trace of one and was probably infertile. The yolk was a fairly deep yellow. The shell is not specially thick. The eggs are rather rounded or broad oval, the shells rather coarse grained but somewhat glossy, coloured a beautiful turquoise blue, obscurely flecked and clouded in a deeper shade, mostly on the larger end.

Hall & Moreau (1970) consider *P. angolensis* to be a member of the insectivorous *P. insignis* species group, which comprises mainly forest-dwelling forms but also *P. olivaceiceps,* of which one race (*nicolli*) is a forest bird and the two other races (nominate *olivaceiceps* and *vicarius*) miombo endemics, allopatric with *P. angolensis*. Further evidence of a possibly close relationship between these 2 rather differently plumaged forms can be adduced from similarities in their nests and eggs, those of *P. o. olivaceiceps* having been described by Benson (1952): in both, the nests, which are suspended from a reasonably substantial branch in the canopy of miombo woodland, consist mainly of *Usnea,* while the eggs are turquoise blue.

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References:
Aspinwall, D. R. 1973. Observations ont he Bar-winged Weaver (*Ploceus angolensis*). *Bull. Zambian Orn. Soc.* 5(2): 73-74.
Benson, C. W. 1952. Further breeding notes from Nyasaland. *Bull. Brit. Orn. Cl.* 72: 65.
Hall, B. P. & Moreau, R. E. 1970. *An Atlas of Speciation in African Passerine Birds:* 292. Trustees of the British Museum (Natural History): London.
Irwin, M. P. S. & Benson, C. W. 1966. Notes on the birds of Zambia, Part 1. *Arnoldia (Rhodesia)* 2(32): 18.

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A third set of additions to the avifauna of Angola

by S. Dillon Ripley and Gorman M. Bond

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In 1957 and 1958, Mr. and Mrs. Gerd Heinrich procured a collection of birds in Angola. Subsequently, 2 reports were published on the birds collected during that expedition (Ripley & Heinrich 1960, 1966). The purpose of the present paper is to present a few additional records which have come to our attention since that time and which are not listed in the most recent checklist of Angolan birds (Traylor 1963).

Since it now appears that scientific collecting expeditions to Angola face an uncertain future and that further avifaunal surveys may have to be postponed indefinitely, the new distributional records listed below seem worthy of putting on record.

Riparia riparia riparia 1♀, Duque de Bragança, Malange. 6 Dec 1957. Traylor lists only one record, from Cabiri, Luanda.

Hirundo angolensis angolensis. 6♂, 5♀, Cacolo, Lunda. Dec 1957–Feb 1958. Not previously recorded from the interior.

Hirundo senegalensis montieri. 1♂, Luanda. 20 July 1957. Common throughout the interior. This is the first record from the coast.

Dicrurus adsimilis coracinus. 2♂, 1♀, Dundo, Lunda. 21–23 Feb 1958. Not previously recorded from the evergreen forest region of northeastern Angola.

Ptyrticus turdinus upembae. 2♂, 1♀, Dundo, Lunda. 24 Feb–7 March 1958. There is another record for this species, from Moxico (Traylor).

Chlorocichla simplex. 2♂, 1♀, Dundo, Lunda. 27–28 Feb 1958. A tropical forest bird. Not previously recorded from the northeast.

Apalis flavida neglecta. 1♂, Rio Luachimo (50 km north of Dala), Lunda. 19 May 1958. This subspecies has not previously been recorded in Angola east of Malange.

Muscicapa cassini. 1♀, 1 sex unknown, Dundo, Lunda. 21 Feb 1958. An evergreen forest bird not previously recorded from northeastern Angola.

Artymyias fuliginosus fuliginosus. 1♀, 1♂, Cacolo, Lunda. 7 and 8 Feb 1958. Not previously recorded from eastern Angola.

Myioparus plumbeus grandior. 2♂, 3♀, Cacolo; 1♂, Lake Carumbo; 2♂, Saurimo, 1♂, Commisombo, Lunda. Dec 1957–Mar 1958. Traylor lists only one record, from eastern Angola (Moxico). These are new records from Lunda.

Myiopornis bohmi. 1♀, Feb 1958, Xá-Cassan, Lunda. 5 Feb 1958. A bird of the central plateau but not previously recorded from Lunda.

Myioparus griseogulare. 5♂, 3♀, Dundo, Lunda. Oct 1957–May 1958. An evergreen forest bird. Traylor lists only one record, from Cuanza Norte.

Terpsiphone rufiventer ignea. 1♂, 1♀, Dundo, Lunda. 28 Feb–7 May 1958. Traylor says 'In Angola known only from the type, probably from Cuanza Norte or Malange'. The female has the underparts paler than the male and the mantle is brown.

Motacilla clara chapini. 1♂, Dundo, Rio Luachimo, Lunda. 15 Feb 1958. Not previously recorded from the evergreen forest region of northeastern Angola.

Motacilla alba vidua. 1♂, Dundo, 19 Feb 1958; 1♂, 1♀, Saurimo 15 km N), 30 Jan 1958; 4♂, 2♀, Rio Kassai (40 km NE Cantar), 5 and 9 Apr 1958. Common, but not previously recorded from Lunda.

Drysocopus senegalensis. 1♂, Dundo, Rio Luachimo, Lunda, 16 Feb 1958. The only Angolan record is from Cabinda.

Laniarius leucorhynchus. 1♀, Dundo, Rio Luachimo, Lunda, 25 Feb 1958. Known only from Cabinda.

Anthreptes anchietae. 1♂, 1♀, Curumbi (Tras os Montes), 22 Dec 1957; Cacolo, 3♂, 1♀, 22 Dec 1957; Cacolo, 3♂, 1♀, 26 Dec 1957–5 Jan 1958. Not previously recorded from Lunda.

Nectarinia cyanolaema octaviae. 1♀, Dundo, 26 Apr 1958; 1♂, 1♀, Rio Luachimo near Dundo, 3 and 4 May 1958; 1♂, Rio Kasai, 40 km NE Canzar, Lunda, 10 Apr 1958. An evergreen forest bird. Traylor lists records only for Cabinda and Cuanza Norte.

Nectarinia reichenbachii. 1♂, Lake Carumbo, Lunda. 26 Mar 1958. Not previously recorded from Angola.

Ploceus plezelni monachus. 1♂, near Dondo, Cuanza Norte. 6 Sep 1957. Previously recorded only from Cabinda and the lower Cuanza River.

Ploceus aurantius aurantius. 1♂ (imm.), Luanda, 3 July 1957. Previously recorded only from Cabinda.

Anomalospiza imberbis imberbis. 1♀ (juv.), Lake Carumbo, Lunda, 25 Mar 1958. Previously known only from Huila and Moxico.
Quelea erythrops. 1♂, 1♀, Cacolo, Lunda. 31 Dec 1957. Not previously recorded from eastern Angola.
Nigrita fusconota fusconota. 1♂, 1♀, Dundo, Lunda. 21 Feb, 5 May 1958. Only one previous record, from northern Lunda (Traylor).
Ortygospiza locustella locustella. 1♂, Duque de Bragança, Malange, 3 Dec 1957; Cacolo, Lunda 20 Jan 1958. Traylor's 3 records from Lunda, Huila and Moxico may be added to the localities listed above.
Vidua funerea nigerrima. 2♂, Lake Carumbo, 19 and 25 Mar 1958; 1♂, Andrada, Lunda, 3 Apr 1958. Not previously recorded from eastern Angola.
Serinus capistratus capistratus. 1♂, Lake Carumbo, Lunda. 23 March 1958. Traylor's only records are from western Angola.

References:
Ripley, S. D. & Heinrich, G. 1960. Additions to the avifauna of northern Angola I. *Postilla* 47: 1–7.
— 1966. Additions to the avifauna of northern Angola II. *Postilla* 95: 1–29.
Traylor, M. 1963. *Check-list of Angolan Birds.* Publicacoes Culturais; Companhia de Diamantes de Angola, Lisboa 61: 1–250.

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What in reality is *Anthreptes pujoli* Berlioz?

by C. Erard

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In 1958, Professor J. Berlioz described as type of a new species, *Anthreptes pujoli*, a male sunbird collected by R. Pujol on 16 Feb 1958 at Seredou, Guinea: specimen No. 1958–544 in the Muséum National d'Histoire Naturelle, Paris. He emphasised its generally similar appearance to the female of *A. rectirostris tephrolaema*, and distinguished it by its yellowish superciliary and especially by narrow whitish tips to the wing coverts, principally the median ones. He did not consider that the specimen could be immature, by reason of the entirely black beak. He also emphasised that, judging at least from the material available, males of both nominate *rectirostris* and *r. tephrolaema* show signs of metallic feathering from an early age, and concluded that he was dealing with a male of a distinct species, near to *rectirostris*, which exhibited a female-like plumage and a characteristic wing pattern.

White (1963: 53) recognises the specific status of *pujoli*, placing it between *A. gabonicus* and *A. fraseri*; and likewise Rand (1967: 218), although between *A. pallidigaster* and *A. rectirostris*. Mackworth-Praed & Grant (1973: 570) cite it as following *A. rectirostris*, but express doubt as to its validity.

The type of *pujoli* has been re-examined. Its measurements (wing 57, bill (from skull) 15, tail 30, tarsus 14·5 mm) and proportions, its form and robustness of bill fall perfectly within the range of those of *A. r. rectirostris* and *A. r. tephrolaema*. The bill appears to be entirely black, but a closer examination shows that the base of the lower mandible, more precisely at the edge of the feathers of the chin, is orange horn.

In the collection of the Museum in Paris there is a specimen (No. 1876–2065), marked as a juvenile male, of *A. r. tephrolaema* from Lambarene, Gabon, collected by M. Marche. Although its preparation is unfortunately not perfect, it is very similar to, if not identical with, the specimen from Seredou, except for one metallic feather on the median coverts of the right wing. Also it has slightly less yellow underparts, more washed with greyish on the chest; but this, if not due to the antiquity of the specimen and its standard of preparation, is understandable, since *r. tephrolaema* has the underparts less yellow than in the nominate form.

On 17 March 1977, at Belinga, northeastern Gabon, I watched a family of *A. r. tephrolaema* containing two young which had recently left the nest and were being actively fed by the adults. The young had the underparts washed with yellow, more olivaceous ont he chest, the upperparts olive-brown and non-metallic, a slight yellowish superciliary and some small pale spots on the wing coverts. Also, they had the beak entirely dark except for the extreme base of the lower mandible, and a tubercle on each side, orange-red.

Thus there does not appear to be any doubt but that *Anthreptes pujoli* is the young of *A. r. rectirostris*. It is very probable that this juvenile plumage with spotted wing coverts is worn only for a very short time after leaving the nest, as is the case in many forest species. One such example is *Bleda syndactyla multicolor* in Gabon, the young of which, as a nestling or fledgling, is entirely rufous, but of which none has ever been observed or captured alive in such plumage.

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References:
Berlioz, J. 1958. Etude d'une collection d'oiseaux de Guinée Française. *Bull. Mus. Nat. Hist. Nat.* 30: 490–497.
Mackworth-Praed, C. W. & Grant, C. H. B. 1973. *Birds of West Central and Western Africa*, Vol. 2. London: Longman.
Rand, A. L. 1967. Nectariniidae. *In Checklist of Birds of the World*, vol. 12. Cambridge, Mass.: Museum of Comparative Zoology.
White, C. M. N. 1963. *A Revised Check-list of African Flycatchers, etc.* Lusaka: Dept. of Game & Fisheries.

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Post-mortem shrinkage of Dunlin *Calidris alpina* skins

by Julian G. Greenwood

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Avian taxonomists encounter difficulties when endeavouring to compare measurements of samples of live birds with those of museum specimens, one of the main difficulties being post-mortem shrinkage of museum skins. Estimates are available for the amount of shrinkage in skins, although the data show considerable variation between and within species. Vepsäläinen (1968) estimated wing shrinkage to be 2% in 11 skins of Lapwing *Vanellus*

vanellus. Green & Williams (1973) estimated wing shrinkage in 7 specimens of Ringed Plover *Charadrius hiaticula* to be 2·7%, whilst wing shrinkage in 4 specimens of Ringed Plover was estimated to be 1·8% (R. C. Taylor). The difference between the two estimates for Ringed Plover wing shrinkage is clearly a result of the small samples involved. In species other than waders wing shrinkage of 1·24% was found in a large sample (66) of Lesser Black-backed Gulls *Larus fuscus* and Herring Gulls *Larus argentatus* (Barth 1967). In the Alaskan Willow Ptarmigan *Lagopus l. alascensis* wing shrinkage was found to be 0·39% in a sample of 275 and shrinkage of the tail in a sample of 239 was estimated to be 0·69% (West *et al.* 1968). Summers (1976) estimated bill shrinkage in the Turnstone *Arenaria interpres* to be 5·4% in males and 4·4% in females, and in the Sanderling *Calidris alba* to be 1·6% in males and 2·7% in females. Unlike the previous authors, Summers did not collect fresh specimens and allow them to dry; he measured a series of freshly collected birds and compared them with skins from local museums (South Africa).

In the present study, specimens of Dunlin *Calidris alpina* were obtained by M. J. Greenhalgh during wader feeding studies on the Ribble estuary. Measurements were taken from freshly killed birds, of which 35 were prepared as museum skins, and in addition 36 pairs of wings were preserved. After 18 months the specimens were remeasured. The measurements taken were right wing length, tail length, bill length and tarsus length. Wing length was measured with a stopped rule, whilst straightening and flattening the primaries. Tail length was measured with dividers from the tip of the central feathers to the point of quill insertion. Bill length was measured with vernier calipers on the upper mandible from the tip to the beginning of the feathers. Tarsus length was measured with dividers from the posterior aspect of the joint between the tarso-metatarsus and tibio-tarsus, to the anterior aspect of the joint between the tarso-metatarsus and the proximal phalange of the middle toe.

TABLE 1

Post-mortem shrinkage of Dunlin *Calidris alpina* skins

	n	Fresh Measurement	Dry Measurement	't'	% shrinkage (only when significant)
Wing length (mm)	71	117.07	115.87	10.988 (P<.001)	1.02
Tail length (mm)	33	46.88	45.74	10.795 (P<0.01)	2.42
Bill length (mm)	33	33.05	33.05	—	—
Tarsus length (mm)	33	24.08	24.06	0.259	—

The data were analysed using the paired-sample 't'-test (Table 1). Wing and tail length show highly significant ($P<\cdot 001$) decreases in length of 1·02% and 2·42% respectively. The decrease in wing length is probably due to the drying of the metacarpal joint. The decrease in tail length is probably due to the drying of the skin at the base of the tail feathers; in freshly killed specimens, and live birds, the skin at the base of the quill offers little resistance to dividers, until they have depressed the flesh a little, whereas the dry skin of museum specimens offers immediate resistance to dividers, with the result

that a shorter measurement is taken. Bill length shows no change at all, and the decrease in tarsus length is not significant.

Comparisons between the measurements of live birds and museum specimens are only valid when comparing samples and not individuals, as individual shrinkage is extremely variable, some skins showing no post-mortem shrinkage, whereas others shrink by a considerable amount. Table 2 shows the variation in the amount of change of wing and tail lengths. The increase in wing length of one specimen emphasises the difficulty in replicating measurements.

TABLE 2

Variation in individual shrinkage of Dunlin *Calidris alpina* skins

Wing length		Tail length	
Change in length (mm)	n	Change in length (mm)	n
+0.5	1	0	0
0	7	—0.5	11
—0.5	20	—1.0	8
—1.0	10	—1.5	8
—1.5	17	—2.0	4
—2.0	7	—2.5	2
—2.5	6		
—3.0	1		
—3.5	1		
—4.5	1		

It must be emphasised that the shrinkage values obtained here refer strictly to Dunlin, and whilst other small sandpipers probably shrink by similar amounts, the shrinkage values almost certainly will not apply to large waders.

References:

Barth, E. K. 1967. Standard body measurements in *Larus argentatus*, *L. fuscus*, *L. canus*, and *L. marinus*. *Nytt. Mag. Zool.* 14: 7–83.

Green, G. H. & Williams, A. E. 1972. The University of Dundee, North-East Greenland Expedition, 1972. Wading Bird Project. Cyclostyled Report.

Summers, R. 1976. The value of bill lengths of museum specimens in biometric studies. *Wader Study Group Bulletin* 17: 10–11.

Vepsäläinen, K. 1968. Wing length of Lapwing (*Vanellus vanellus*) before and after skinning with remarks on measuring methods. *Ornis Fennica* 45: 124–126.

West, G. C., Savage, S., Irving, L., & Peyton, L. J. 1968. Morphological homogeneity of a population of Alaska Willow Ptarmigan. *Condor* 70: 340–347.

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Hybridization amongst the Paradisaeidae

by Errol Fuller

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There are approximately 40 widely accepted species belonging to the family Paradisaeidae, but there remain more than 20 additional forms, the exact status of each of which is obscure and has never been satisfactorily determined. Certainly, they have not been thoroughly reviewed for many years, and they constitute the so-called 'hybrid' or 'rare' birds of paradise, all showing one uniting feature—exceptional scarcity, being known only from

isolated and usually ageing museum specimens, often without locality data. A few are represented by just the type, *Epimachus astrapioides* Rothschild, 1897, and *Neoparadisaea ruysi* van Oort, 1906 for example; whilst varieties like *Rhipidornis gulielmi-tertii* Meyer, 1875, are to be found in several of the world's museums. Most have been known since the heyday of Victorian plume hunting, and did indeed come to light exclusively as a result of that trade, none having ever been observed by ornithologists on their home grounds. Although almost all were originally regarded as distinct species, and named accordingly, the mystery surrounding the origin of these rare forms caused commentators to speculate that hybridization may have been responsible for some. This view was not widely held until Stresemann (1930) proposed a definite hybrid parentage for 19 of the rarer birds. His conclusions were accepted by almost all succeeding workers, and Stresemann's paper is still the standard authority, having been questioned only by Iredale (1950). Gilliard (1969) indicates some dissatisfaction but does not review the problematical forms in any depth, whilst most authors describe the widely recognized species but relegate the putative hybrids to a mere listing at best.

There are at least 24 distinct problematical forms. Stresemann deals with 19 of them, of which one is a bower bird, and to which can be added *Paradisaea apoda luptoni* Lowe, 1923, *Paraidsaea bloodi* Iredale, 1948, and *Astrarchia barnesi* Iredale, 1948. There is also a unique bird taken in 1939, immediately considered a hybrid, which is left unnamed (see Junge 1953), an unnamed cross between *Paradisaea raggiana salvadorii* and *Paraidsaea minor finschi* (see Gilliard 1969), and a suggested cross between *Paradisaea rudolphi* and *Parotia lawesii* (Schodde in prep.).

Stresemann's argument was built around 2 main points:—the 'rare' forms had all eluded discovery on their home grounds; and some of the specimens appeared, in his opinion, to show plumage characteristics of more than one species. With one possible exception (*Paryphephorus duivenbodei* Meyer, 1890) the proposed parents for each form are either sympatric, or are almost allopatric, but with distinct restricted zones of overlap. There can be no doubt that a number of Stresemann's designations are correct, but re-evaluation of those about which there is more doubt is overdue.

Recognized hybrids

Four forms are definitely known to be the result of hybridization in the wild state. *Astrapia stephaniae* and *Astrapia mayeri* produce the form named *Astrarchia barnesi* Iredale, 1948, along a narrow zone of overlap. Observations in the field support the view that species within the genus *Paradisaea* have combined: *Paradisaea raggiana salvadorii* couples with *Paradisaea apoda novae-guinea* to produce the form described as *P. apoda luptoni*; *P. minor finschi* combines with *P. raggiana augustae-victoriae* to produce *P. mixta* Rothschild, 1921; whilst another hybrid form occurs where *P. minor finschi* meets *P. raggiana salvadorii* (see Gilliard 1969). There is apparently no further field evidence for hybridization amongst the Paradisaeidae. Their close relatives, the bower birds, have produced at least one hybrid: *Ailuroedus crassirostris* has paired with *Ailuroedus melanotis* under aviary conditions, but crosses would not occur in the wild, for the birds are allopatric.

It will be noticed that all reliably recorded unions are between closely related birds, whereas a number of Stresemann's other designations involve crosses between widely diverse genera. No definite evidence yet exists to support the view that birds belonging to differing genera regularly interbreed, or that hybrids are produced between species that are normally sympatric, for the hybrids referred to above occur in distinct zones of species overlap only. The fact that closely related forms representing one another geographically or altitudinally, hybridize where their ranges meet, needs to be differentiated from the occasional production of hybrids between species which normally co-exist. Whilst it is not difficult to visualize a pairing between *Paradisaea apoda* and *P. raggiana*, couplings between genera as diverse as *Ptilorhis* and *Paradisaea*, or *Paradigalla* and *Lophorina* require positive proofs to be convincing. One difficulty is that Stresemann put forward many of his conclusions with little discussion of the reasons behind them; for example in writing of *Lamprothorax wilhelminae* Meyer, 1894, he states merely that the form is confusing, that it carries 2 elongated central tail feathers and that 3 specimens are known. The proposition that the bird is a hybrid of *Diphyllodes magnificus* and *Lophorina superba* is stated but not discussed. It may be tempting to assume that the indisputable cases of hybridization represent a vindication of all of Stresemann's views, but each case requires to be decided on its own merits.

The failure of ornithologists to discover living examples of the 'rare' forms

Stresemann considered that New Guinea had been thoroughly searched, and therefore that any unknown populations of birds of paradise would have been located; but much of New Guinea is still a formidable wilderness and a considerable number of interesting ornithological discoveries have been made there since 1930, as follows: A new bird of paradise, *Astrapia mayeri* Stoner, 1939, has been described. The bower bird *Archboldia papuensis* Rand, 1940 has been discovered since 1930, and is now known to have a discontinuous range along the central mountain chain of New Guinea; some authorities (Filewood 1976) divide the populations into 2 species, whilst others (Gilliard 1969) suggest that it may be incorrect to do so. A bird discovered on Mt. Hagen, central New Guinea, was named *Paradisaea bloodi* Iredale, 1948, but is now considered to be a hybrid of *P. raggiana* and *P. rudolphi* (Mayr *in* Peters 1962). Another new form, *Astrarchia barnesi* Iredale, 1948, was collected almost simultaneously and later proved by Shaw-Mayer to be a hybrid (Sims 1956). A sub-species of *Paradisaea minor* was found on Misol Island and named *pulchra* Mayr & de Schauensee, 1939, whilst an isolated population of *Epimachus fastuosus* has been discovered on Mt. Menawa, Sepik Mts. and named *ultimus* Diamond, 1969. If these birds remained undiscovered for so long, might not there be others, and might not some of these hidden populations include birds hitherto regarded as hybrids?

It is not surprising that scarce species should prove difficult to locate in New Guinea. The breeding pattern of many of the Paradisaeidae involves a number of males being concentrated in one place, so that it is possible that 'rare' species may be merely very local, but nevertheless common in their restricted area. If this is so, why did the plume hunters who took the unique examples fail to get several specimens? There is, in fact, nothing incontravertible to show that they did fail. It would be unwise to assume that all

specimens taken fell into the hands of Europeans; noi would all specimens that did reach Europe necessarily have come to the attention of someone capable of categorizing them.

There can be little doubt that there still remain undiscovered bird forms in New Guinea to add to the resident avifauna of approximately 570 species. It is not likely that all these would be birds of paradise, but it is conceivable that some could be. If any of the putative hybrids merit recognition as full species, it is feasible that in some cases such species may no longer be extant, having perhaps been eliminated by the very pressures of plume hunting that brought their existence to light in the first place.

Morphology

Stresemann's investiagtion was largely based on morphological characters. In some of the 'rare' forms traces of the plumage of more than one of the well known species are detectable, but in other cases features cited do not represent totally convincing proofs, and corroborative evidence is lacking. For example, the parentage of the form known as *Pseudastrapia lobata* Rothschild, 1907 is given as *Paradigalla carunculata* and *Epimachus fastuosus*; but the dissimilarity of their breeding behaviour makes the proposition most unlikely. For one thing, the sexes of *Paradigalla* are almost identical, indicating the likelihood of monogamous association (Forshaw 1977), whereas those of *Epimachus* are clearly dimorphic, the species being not only polygynous, but courtship involving an elaborate and specialized ritual display. To be convincing, therefore, clear marks of both species in the plumage of *Pseudastrapia* are necessary, and the evidence Stresemann puts forward is not entirely adequate. There is only one known specimen and he indicates that it shows marks of immaturity, so that the adult size and plumage are in doubt; it lacks the jewelled back of the adult *Epimachus*, and is intermediate in size between *Epimachus* and *Paradigalla*. The bill is also noted to be intermediate in size, but is a little hooked, suggesting *Epimachus*. *Pseudastrapia*, further, has slight lobing of the gape which Stresemann suggests is the result of crossing *Paradigalla*'s large wattle with the absence of any wattle in *Epimachus*. *Paradigalla* has also been cited equally unconvincingly as pairing with 2 other sexually dimorphic genera, *Parotia* and *Lophorina*. Both misalliances must be considered unlikely on ethological grounds at least.

Another revealing case is that of *Epimachus ellioti* Ward, 1873, a form which Stresemann considered to be a hybrid of *Epimachus fastuosus* and *Astrapia nigra*. A distinctly different bird known as *Epimachus astrapioides* Rothschild, 1897 had previously been put forward as the offspring of these putative parents, and to account for the differences in plumage Stresemann proposed that *ellioti* be considered the reciprical or reversed cross to *astrapioides*. Rothschild, in Stresemann (1930), indicated that he did not find this solution convincing and appended his own set of suggestions to Stresemann's paper. These were that *E. ellioti* (known from at least 2 specimens) is the product of *Pseudastrapia lobata* (known from one specimen only) × *Astrapia nigra*, or alternatively of *E. astrapioides* (again known from only one specimen) × *Paradigalla carunculata*. This makes *E. ellioti* a secondary hybrid involving initial hybrids that are known by only half as many specimens as their own progeny, and assumes fertility retention between no less than 3 genera. It

seems extraordinary that such conclusions have not even been challenged. Two taxonomists, both with considerable experience of the Paradisaeidae, were unable to agree on the ancestry of one form. Clearly the plumage evidence was not unequivocal, and the conclusions drawn must therefore be equally questionable. The type of *ellioti* (BMNH: 1881.5.1.1696) has been lost (Fuller in prep.) but a second specimen exists in the Dresden Museum. Photographs (S. Eck, pers. comm.) of this specimen suggest that the bird is an unmixed *Epimachus*; certainly the early workers who examined specimens when fresh saw no reason to doubt its validity as a species (Elliot 1873, Sharpe 1898, Meyer 1890).

Some specimens of birds of paradise are demonstrably hybrids, others are likely to be so, but in many cases the available evidence is far too thin for dogmatic conclusions, and discussion often lacks the detail necessary to evaluate the proposals regarding the parentage with anything but caution. There are, indeed, as good grounds for thinking it likely that some of the 'hybrid' birds of paradise are legitimate species, as there are for the opposite view.

Displays

It is well known that in the Paradisaeidae communal sexual display and ornamentation is of great importance in many species. Conceivably, in an 'arena' a fully aroused male with polygamous habits may mistake the drab female of another species as its own and the female may allow mating, especially if inexperienced. This is a possibility in the case of closely related species with an overlapping range, but it does not seem likely in birds of more distant relationship. It is generally recognized that even slight differences in display act as a brake on mating—indeed this is a function of such differences—so that discrepancies in display would surely represent insurmountable obstacles between genera such as *Ptilorhis* and *Paradisaea*, or *Diphyllodes* and *Lophorina*. The improbability of *Paradigalla* crossing with *Lophorina*, *Parotia* or *Epimachus* has already been commented upon, yet Stresemann's suggestions involve all of these, and, further, it seems improbable that any such matings would prove fertile.

Critical Probabilities

For a hybrid to be recognizable and acceptable 4 conditions probably need to be complied with:—

1. There should be marked similarity with the plumage of both putative parents.

2. The putative parents should be closely related.

3. The distribution ranges should be compatible.

4. There should be no barriers to the two parent species meeting in appropriate breeding conditions and habitat.

In the light of such conditions a number of Stresemann's propositions need careful review.

Table 1 lists each form according to taxonomic probability. Those in Group A have already been discussed. Of the forms in Group B, 5, 6 and 7 are considered acceptable as hybrids because of the closeness of relationship between putative parents and the supposed hybrids bearing clear morphological marks of both parents. Gilliard (1969) maintains that in each case suggested parents come into contact along zones of altitudinal overlap. Relationships between the respective proposed parents of 8 and 9 are not as close. However, Diamond (1972) and Schodde (1976) have proposed joining *Diphyllodes* with *Cicinnurus*, whilst *Astrapia* and *Epimachus* are placed alongside each other by most systematists. In *Rhipidornis* (represented in many museums) marks of both proposed parents are so clear that a hybrid origin can hardly be doubted. This applies equally to *astrapioides* (LeCroy, pers. comm.). In Group C, traces of the plumage of both suggested parents can be detected and the possibility exists that these are hybrid forms. However, Schodde's (1976) analysis of relationships within the Paradisaeidae shows that in each case (with the exception of 10) the genera involved are widely separated. Number 13 is included here solely on account of Junge's (1953) description. The cross does not seem likely. In Group D, 2 very similar forms are listed. Stresemann's proposal is that they represent crosses between *Cicinnurus regius*♂ and *Diphyllodes magnificus*♀, and that such pairings occur less frequently than those between *Cicinnurus regius*♀ and *Diphyllodes magnificus*♂ which allegedly produce *Rhipidornis gulielmi-tertii*. Rothschild (in Stresemann 1930) argued that since the characters of *Cicinnurus regius* strongly predominate in both *goodfellowi* and *lyogyrus* it is possible to consider them crosses between *regius* and its own hybrid *gulielmi-tertii*. This may be so, but the specimens are so close to *regius* that they could conceivably be merely individual variants. In Group E are those forms which are unlikely to be hybrids of the parents proposed and may in fact be legitimate species. Numbers 16 and 17 are not mentioned further, having already been considered. *Paradigalla* is alleged to have paired with *Parotia* and *Lophorina*—both sexually dimorphic genera—to produce hybrids. In the case of *Loborhamphus ptilorhis* Stresemann does not list any features to connect the form with either putative parent, although, curiously, he notes a resemblance to the ♀ *Astrapia*. A comparison of the type specimen (Fuller in prep.) with *Parotia* and *Paradigalla* provides no support for his conclusion. The characters of *Loborhamphus nobilis* cited as evidence of the partnership of *Paradigalla* and *Lophorina* are not unequivocal and in view of ethological barriers the proposition cannot be regarded as satisfactory. A specimen of *Paryphephorus duivenbodei* in the BMNH does not show incontrovertible characters of both putative parents which would point to hybridization. Gilliard (1969) maintains that *Lophorina* is free from any possibility of interaction with *Ptilorhis*, their altitudinal ranges being incompatible. Stresemann's argument in the case of *Janthothorax bensbachi* is not clear. He claims that once the significance of the form *Janthothorax mirabilis* has been appreciated, it becomes possible to regard *bensbachi* as a cross of *Ptilorhis magnifica* and *Paradisaea minor*; but his conclusion in respect of *mirabilis* remains unproven and *mirabilis* allegedly springs from a different combination of parents to *bensbachi*. The specific morphological evidence cited is the black underside of the putative hybrid and the quality of shimmer that its plumage shows—both features supposedly indicating *Ptilorhis*. These grounds are not considered sufficiently conclusive

TABLE 1

Hybrid and putative hybrid Birds of Paradise grouped according to their taxonomic probabilities.

(Where no reference is given putative parents are those proposed by Stresemann)

Group A. Forms occuring in the field which are known to be the result of hybridization.

1. *Astrarchia barnesi* Iredale, 1948=*Astrapia stephaniae* x *Astrapia mayeri* (see Sims 1956)
2. *Paradisaea apoda luptoni* Lowe, 1923=*Paradisaea apoda novae-guinea* x *Paradisaea raggiana salvadorii* (see Gilliard 1969)
3. *Paradisaea mixta* Rothschild, 1921=*Paradisaea minor finschi* x *Paradisaea raggiana augustae-victoriae* (see Gilliard 1969)
4. Un-named form similar to *mixta*=*Paradisaea raggiana salvadorii* x *Paradisaea minor finschi* (see Gilliard 1969)

Group B. Forms which are likely to be of hybrid origin.

5. *Paradisaea bloodi* Iredale, 1948 (*Paradisaea raggiana salvadorii* x *Paradisaea rudolphi margaritae*, see Mayr 1962)
6. *Paradisaea maria* Reichenow, 1894 (*Paradisaea guilielmii* x *Paradisaea raggiana augustae-victoriae*)
7. *Paradisaea duivenbodei* Menegaux, 1913 (*Paradisaea guilielmii* x *Paradisaea minor finschi*)
8. *Rhipidornis gulielmi-tertii* Meyer, 1875 (*Diphyllodes magnificus* x *Cicinnurus regius*)
9. *Epimachus astrapioides* Rothschild, 1897 (*Epimachus fastuosus* x *Astrapia nigra*)

Group C. Forms which show features of both putative parents, and may be hybrids, but about which it is difficult to draw definite taxonomic conclusions.

10. *Parotia duivenbodei* Rothschild, 1900 (*Parotia sefilata* x *Lophorina superba*)
11. *Janthothorax mirabilis* Reichenow, 1901 (*Seleucides melanoleuca* x *Paradisaea minor*)
12. *Heteroptilorhis mantoui* Oustalet, 1891 (*Seleucides melanoleuca* x *Ptilorhis magnifica*)
13. *Epimachus fastuosus atratus* x *Lophorina superba feminina* (see Junge 1953)

Group D. Forms which are very close to the first mentioned of the putative parents and whose precise relationships are obscure.

14. *Cicinnurus lyogyrus* Currie, 1900 (*Cicinnurus regius* x *Diphyllodes magnificus*)
15. *Cicinnurus goodfellowi* Ogilvie-Grant, 1902 (*Cicinnurus regius* x *Diphyllodes magnificus*)

Group E. Forms which seem unlikely to be hybrids between the proposed genera.

16. *Epimachus ellioti* Ward, 1873 (*Epimachus fastuosus* x *Astrapia nigra*)
17. *Pseudastrapia lobata** Rothschild, 1907 (*Epimachus fastuosus* x *Paradigalla carunculata*)
18. *Loborhamphus ptilorhis** Sharpe, 1908 (*Paradigalla carunculata* x *Parotia sefilata*)
19. *Loborhamphus nobilis* Rothschild, 1901 (*Paradigalla carunculata* x *Lophorina superba*)
20. *Paryphephorus duivenbodei* Meyer, 1890 (*Ptilorhis magnifica* x *Lophorina superba*)
21. *Janthothorax bensbachi* Buttikofer, 1895 (*Ptilorhis magnifica* x *Paradisaea minor*)
22. *Lamprothorax wilhelminae* Meyer, 1894 (*Lophorina superba* x *Diphyllodes magnificus*)
23. *Neoparadisaea ruysi** van Oort, 1906 (*Diphyllodes magnificus* x *Paradisaea minor*)

*denotes a form, represented by a single specimen, which may not show fully mature plumage.

to enable the proposition of the pairing of 2 widely separated genera to be upheld. In the cases of *Lamprothorax wilhelminae* and *Neoparadisaea ruysi* no evidence is given to support hybrid designations. Neither form appears to show particularly marked features of both their respective putative parents, and again it does not seem likely that crosses would occur between the suggested genera.

A possible cross between *Paradisaea rudolphi* and *Parotia lawesii* (Schodde in prep.) has not been included in Table 1 as detailed information is not yet available.

It seems essential that all information relating to these birds should be reviewed while specimens are still extant—one (*Epimachus ellioti*) has already vanished and many are almost 100 years old. In addition, what is required is careful exploration and study in areas where accepted species' ranges overlap and where they have produced the hybrids designated by Stresemann.

Acknowledgements: For their help and comments during preparation of this paper, I am indebted to Margaret Ramsaran, I. C. J. Galbraith (British Museum (Natural History)), Mary LeCroy (American Museum of Natural History), S. Eck (Staatliches Museum fur Tierkunde, Dresden), G. F. Mees (Rijksmuseum van Natuurlijke Historie), and R. Schodde (CSIRO, Canberra).

References:

Bock, W. J. 1963. Relationships between the birds of paradise and the bower birds. *Condor* 65 (2): 91–125.

Diamond, J. M. 1969. Preliminary results of an ornithological exploration of the North Coastal Range, New Guinea. *Amer. Mus. Novit.* 2362: 1–57.

Diamond, J. M. 1972. Avifauna of the Eastern Highlands of New Guinea. *Cambridge, Mass. Publ. Nuttall Orn. Cl.* 12.

Elliot, D. G. 1873. *A Monograph of the Paradisaeidae.* London.

Filewood, W. 1976. *Birds of New Guinea and tropical Australia.* Reed: Sydney.

Forshaw, J. & Cooper, W. 1977. *The Birds of Paradise and Bower Birds.* Collins: London.

Gilliard, E. T. 1969. *Birds of Paradise and Bower Birds.* Weidenfeld and Nicholson: London.

Iredale, T. 1950. *Birds of Paradise and Bower Birds.* Georgian House: Melbourne.

Junge, 1953. Zoological results of the Dutch New Guinea Expedition, 1939. *Zool. Verh.* 20: 62.

Mayr, E. 1962. *In* Peters, J. L. *Check-list of Birds of the World*, Vol. XV. Cambridge, Mass: Mus. Comp. Zool.

Schodde, R. 1976. Evolution in the birds of paradise and bowerbirds: a resynthesis. *Proc. XVI Orn. Congr.* Canberra: 137–149.

Sharpe, R. B. 1891–1898. *Monograph of the Paradisaeidae and Ptilonorhynchidae.* London.

Sims, R. W. 1956. Birds collected by Mr. F. Shaw-Mayer in the central highlands of New Guinea, 1950–1951. *Bull. Brit. Mus.* (*Nat. Hist.*), 3, no. 10.

Stresemann, E. 1930. Welche Paradiesvogelarten der Literatur sind Hybriden Ursprungs? *Novit. Zool.* 36: 6–13.

The author is collecting material for a detailed work on hybrid and putative hybrid birds of paradise. A number of specimens unknown to Stresemann or taken after 1930 have been located, but there are possibly others in museum collections which have not come to notice, and the author would value any information about such from authorities with whom he has not already been in contact. He would also be pleased to receive any information about problematical forms which readers of this notice may consider to be of relevance.

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The European Swift *Apus apus* on Assumption Island

by J. C. Lawley

Received 4 August 1979

While on a voyage on the M. V. 'Mauritius' from the Seychelles to Mauritius, I spent one week on Assumption, 26 October to 2 November 1978, while phosphate was being loaded. During this period I had excellent views of what I believe to have been *Apus apus*, at 16.30 hrs on 29 October and 08.00 hrs on 1 November. On both occasions a single bird was circling around apparently foraging, at less than 20 m above the ground. Local information was that such 'hirondelles' are regular visitors, although Stoddart *et al.* (1970: 137) quote but one record, of an apparent *Hirundo rustica*.

Feare (1979) refers to records of black swifts, presumed to be *A. apus*, from the Seychelles, Amirantes and Aldabra (the last named only 27 km northwest of Assumption, and where both *A. a. apus* and *pekinensis* have been collected (–cf Frith 1974: 15). In further detail (unpublished) in 1972 he saw 2 presumed *A. apus* on Bird Island, Seychelles, on 29 September and singles on 31 October, and 6 and 14 November. My sightings were certainly not of the white-rumped *A. pacificus*, but of a black swift indistinguishable from *A. apus* as I know it in England. Nevertheless there is the alternative that they might be referable to *A. barbatus*. Benson *et al.* (1976: 233) suggest that *A. barbatus balstoni* of Madagascar might winter in eastern Africa (if so, it would be almost certain to occur on passage over such islands as Aldabra and Assumption). There is the particularly telling observation by Rand (1936: 413) from Mt d'Ambre, extreme northern Madagascar, of a steady flight each morning during the first part of October, of birds coming in from the Mozambique channel, from the northwest. The gonads of most of those collected showed some enlargement. Benson has shown me specimens of *A. a. apus* and *A. b. balstoni*. It would have been quite impossible for me to have distinguished between the 2 from my sightings. However, considering also other observations on *balstoni* in Madagascar referred to by Benson *et al.* (*loc. cit.*), the end of October seems unduly late for its occurrence over Assumption. It seems much more probable that my sightings are referable to *A. apus*, not *barbatus*.

I am grateful to C. W. Benson and Dr. C. J. Feare for advice in preparing this note.

References:

Benson, C. W., Colebrook-Robjent, J. F. R. & Williams, A. 1976. Contribution à l'ornithologie de Madagascar (part 2). *L'Oiseau et R.F.O.* 46: 209–242.

Feare, C. J. 1979. *Apus pacificus* in the Seychelles. *Bull. Brit. Orn. Cl.* 99: 75–77.

Frith, C. B. 1974. New observations of migrants and vagrants for Aladabra, Farquhar and Astove Atolls, Indian Ocean. *Bull. Brit. Orn. Cl.* 94: 12–19.

Rand, A. L. 1936. The distribution and habits of Madagascar birds. *Bull. Amer. Mus. Nat. Hist.* 72: 143–499.

Stoddart, D. R., Benson, C. W. & Peake, J. F. 1970. Ecological change and effects of phosphate mining on Assumption Island. *Atoll Res. Bull.* 136: 121–145.

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IN BRIEF

An influx of Australian pelicans *Pelecanus conspicillatus* in Indonesia

During the southern winter of 1978 there was an irruption of Australian Pelicans *Pelecanus conspicillatus* into Indonesia. The wintering range of this species in Indonesia is known to include the southern part of West Irian and the Tanimbar Islands (Mayr 1941) and the south Moluccas (Van Bemmel 1948), and Voous (1962) reports one record from Flores in about September of 1960. In 1978 these pelicans were reported widely in Sulawesi, the Lesser Sunda Islands and Java.

The first arrivals probably reached Timor at the end of May, and from the end of June onwards they were reported commonly in the news media from the South Moluccas (Ambon and Seram), Halmahera, Sumbawa, Lombok, Bali, Java and Sulawesi. The most northerly records are from Halmahera and near Toli-Toli in the north of Central Sulawesi, and the most westerly are from near Bogor in West Java, though a pelican, probably this species, was seen at the Way Kambas reserve in southernmost Sumatra in October (J. Wind).

No estimate can be made of the total number of birds involved. Flocks of 150 birds were reported from Sumbawa, Lombok, East Java and the Luwuk area of Central Sulawesi. The largest flock reported was of about 300 birds in West Sumbawa. Many pelicans were captured or killed and one hundred were presented to zoos. The last reported observations were from Sulawesi in early and mid-December. No reports have been received in 1979 up to the time of writing (19 August).

The irruption is probably the result of a series of successful breeding seasons in Australia, followed by a drought and unfavourable conditions in 1978 (*per* CSIRO). Birds may have been displaced by the poor weather that was reported in the Timor area in May and June, and carried downwind beyond their normal wintering range. While there were several reported observations on ringed birds, there was only one recovery: a bird killed in West Lombok had been ringed as a nestling at Le Lievre swamp in Western Australia in July 1974.

Acknowledgements: This note has been prepared from newspaper cuttings and from the report of a study team led by the senior author under the auspices of the Directorate of Nature Conservation of the Government of Indonesia.

References:

Mayr, E. 1941. *List of New Guinea Birds*. Amer. Mus. Nat. Hist: New York.
Van Bemmel, A. C. V. 1948. A faunal list of the birds of the Moluccan Islands. *Treubia* 19: 323–402.
Voous, K. H. 1967. Australian Pelican recorded in Indonesia. *Emu* 67: 124.

24 August 1979 S. Somadikarta & D. A. Holmes

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The white rumped swift seen at the Agalegas and migrations of the Horus Swift *Apus horus*

Feare (1979) suggests that a swift with a white rump seen on 28 June 1974 at the Agalega Islands (c. 10° 25′S, 56° 40′E) in the Indian Ocean by A. S. Cheke was probably the Pacific White-rumped Swift *Apus pacificus* in the light of the records of this species in the Seychelles and Amirantes that he discusses, and not the Horus Swift *A. horus* as Mr. Cheke thought. It is not possible on the basis of probabilities of distribution to settle the question but the occurrence of *A. horus* at the Agalegas in late June is not distributionally improbable.

Brooke (1971) pointed out that the populations of *A. horus* breeding on the plateau of Zimbabwe Rhodesia were breeding summer visitors and that they did not appear to winter in nearby valleys lying below 500 m a.s.l. where another resident population bred in the winter. Brooke supported his view with some personal data of P. Steyn, who studied birds between 1961 and 1973 at Essexvale where there is a large colony of *A. horus* breeding in holes made by Whitefronted Bee-eaters *Merops bullockoides*. The swifts were normally present in numbers between September and May. The earliest first arrival date was 13 August 1966, though numbers seen were never great in August. The birds had left by 21 May 1966 but were still present on 28 May 1967 after a late rainy season and lack of the usual frost in May. The majority had left by 11 May 1969 though a few were still feeding young in their nests.

McLachlan & Liversidge (1979) regard all South African populations as bieeding summer visitors but the only published dates seem to be those of Harwin (1960): 25 October 1952 to 24 April 1953 at Springs in the Transvaal. Thus there are substantial populations in the south of the range of *A. horus* which move north for the winter and it is not improbable that the Agalegas are among the places sometimes visited. It is not likely that the Agalegas would be visited in late June by birds breeding in Kenya or elsewhere in east Africa since the egg laying season there is March to July (Brooke 1971).

References:

Brooke, R. K. 1971. Breeding of swifts in ethiopian Africa and adjacent islands. *Ostrich* 42: 5–36.

Feare, C. J. 1979. *Apus pacificus* in the Seychelles. *Bull. Brit. Orn. Cl.* 99: 75–77.

Harwin, R. M. 1960. Notes on the Horus Swift. *Ostrich* 31: 20–24.

McLachlan, G. R. & Liversidge, R. 1979. *Roberts Birds of South Africa*. Trustees Voelcker Bird Book Fund: Cape Town.

11 September 1979 R. K. Brooke & Peter Steyn

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A note on the status of *Falco concolor* in southeastern Africa

In my article 'Sight records of the Sooty Falcon *Falco concolor* in Zambia' (*Bull. B.O.C.* 1979: 99(2): 63–65) I inferred criticism on the comment made by R. J. Dowsett in Snow 1978 *An Atlas of Speciation in African Non-passerine Birds* that records from southeastern Africa should have been 'December and March' not 'December to March'. However I overlooked a record (Clancey, 1970 *Ostrich*: 261) of a specimen collected on the Natal/Cape border on 16 January 1967. This January record is likely to be of a bird 'wintering' in this area and thus Dowsett's comment to this effect is more tenable even though the records are so scarce as to suggest that it 'winters' in this area very irregularly in small numbers.

12 September 1979 E. H. Penry

Address: P.O. Box 1900, Kitwe, Zambia.

BOOKS RECEIVED

Davis, R. P. 1979. *The Protection of Wild Birds*. Pp. 18. Soft covers. Barry Rose: Chichester. £1.25.

The author discusses the realities of the efficacy of The Protection of Birds Acts 1954–1967 and the execution of their provisions and finds them wanting as a deterrent either because of the difficulties of law enforcement or through lack of firm dealing with offenders. The fourth chapter is a useful guide to those concerned with prosecutions.

Todd, F. S. 1979. *Waterfowl. Ducks, Geese and Swans of the World*. Pp. 414, over 750 colour photographs. Harcourt Brace Jovanovich: London. £25.00.

The beautiful illustrations, the portraits mainly of captive birds, will be the big attraction of this elegant book, but the text is comprehensive, authoritative and most readable, covering all the families and tribes. There are some very salient points and opinions expressed in the final chapter 'Man and the future of waterfowl'. The appendix 'Concise reference guide to the waterfowl' is in tabular form and should be most useful as a quick source of information.

Walter, H. 1979. *Eleanora's Falcon*. Pp. xii+410, 59 line drawings, 38 photographs. University of Chicago Press: Chicago. £24.50.

An expert's well expressed views resulting from many years study of this much admired European falcon on its Mediterranean island colonies and on its long migration to Madagascar. The sub-title 'Adaptations to prey and habitat in a social raptor' indicates the scientific approach adopted and it is backed up by a great quantity of analysed data given in 38 tables, 59 figures and 4 appendices, but with a comparatively discursive text. There is a long bibliography.

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